ALASKA
Department of
Environmental
Conservation

SITE CHARACTERIZATION
4TH AND GAMBELL SITE
ALASKA REAL ESTATE PARKING LOT

DRAFT
September 2008

Prepared by:

oasis
ENVIRONMENTAL

825 W. 8th Ave.
Anchorage, AK 99501

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ACRONYMS AND ABBREVIATIONS

ADEC ..... Alaska Department of Environmental Conservation
bgs ..... Below ground surface
CSM ..... Conceptual site model
DCE..... Dichloroethene
DO..... Dissolved oxygen
DRO ..... Diesel range organics
EPA..... Environmental Protection Agency
ESA..... Environmental site assessment
GCL..... Groundwater cleanup level
GRO ..... Gasoline range organics
IDW ..... Investigation-derived waste
µg/kg ..... Micrograms per kilogram
µg/L ..... Micrograms per liter
mg/kg ..... Milligrams per kilogram
mg/L ..... Milligrams per liter
MS/MSD..... Matrix spike/matrix spike duplicate
NC ..... Northern Commercial
OASIS ..... OASIS Environmental, Inc.
PCE..... Tetrachloroethene
PID ..... Photo-ionization detector
PPE..... Personal protective equipment
ppm ..... Parts per million
RCRA..... Resource Conservation and Recovery Act
RPD..... Relative percent difference
SCL ..... Soil cleanup level
TCE..... Trichloroethene
UST..... Underground storage tank
VOC ..... Volatile organic compound

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EXECUTIVE SUMMARY

OASIS Environmental, Inc., conducted a site characterization of the Alaska Real Estate parking lot (the "4th and Gambell site") on behalf of the Alaska Department of Environmental Conservation (ADEC) in July 2008. The site characterization included drilling six soil borings, soil screening and sampling, and sampling of temporary and permanent monitoring wells.

Field screening and analytical results of soil samples from the soil borings, in addition to data from previous investigations at the site, indicate that much of the area of the former C&K Cleaners and the residential area north of the site has concentrations of tetrachloroethene (PCE) in vadose zone soil that exceed ADEC soil cleanup levels. Near the location of the former C&K Cleaners, PCE-contaminated soil begins at ground surface and extends to the groundwater interface, located approximately 40 feet below ground surface (bgs). At locations on the residential property to the north, the PCE-contaminated soil appears to begin approximately 10 feet bgs and extend to the groundwater interface. At this point in the characterization process, however, there is insufficient data to delineate the areal extent of the PCE-contaminated soil.

Analytical results of groundwater samples from temporary and permanent monitoring wells, in addition to data from previous investigations at the site, indicate that groundwater is contaminated with PCE at concentrations that exceed the groundwater cleanup level. The plume of contamination appears to extend both westward and northward beyond site boundaries, but there are insufficient data points to map the areal extent of the plume.

The updated conceptual site model indicates that residences to the north of the site are at risk for inhalation of PCE from the soil and groundwater contamination.

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1. INTRODUCTION

Under Notice-to-Proceed 18-9028-13-61, the Alaska Department of Environmental Conservation (ADEC) tasked OASIS Environmental, Inc. (OASIS) with conducting a site characterization of the perimeter of the Alaska Real Estate parking lot (hereafter known as the "4th and Gambell site" or just "the site") in Anchorage, Alaska. The site is located on the northeast corner of the 4th Avenue and Gambell Street intersection (Figure 1). This document presents field observations and analytical results from the site characterization. It also includes a conceptual site model based on data collected during field activities.

1.1. Scope of Work

Based on ADEC's request for proposal, the objective for this project was to identify the nature and extent of contamination downgradient of 4th Avenue and Gambell Street.

1.2. Project Organization

ADEC contracted OASIS to manage and execute this project. The important entities involved with the execution of this project are the following:

- Owners – Mr. Paul Maney, owner of the 4th and Gambell site; Vickie Nickolich, owner of the property at southeast corner of 3rd Avenue and Gambell Street; and Mark Cupples, owner of the property at the southwest corner of 3rd Avenue and Hyder Street.
- Third-Party Environmental Assessor – OASIS, 825 W 8th Ave, Anchorage, Alaska, 99501.
- Drilling Subcontractor – GeoTek Alaska, Inc., 907 East Dowling Road, Ste 16, Anchorage, Alaska, 99518.
- Laboratory Subcontractors – OnSite Environmental, Inc., 14648 NE 95th Street, Redmond, Washington, 98052.
- Waste Subcontractor – Emerald Alaska, Inc., 2020 Viking Drive, Anchorage, Alaska, 99501.

1.3. Regulatory Framework

A regulatory framework for this project has been developed using the following regulations and guidance documents:

- ADEC, 18 AAC 75, *Oil and Other Hazardous Substances Pollution Control, June 9, 2008, under review by the Department of Law*
- ADEC, *Underground Storage Tanks Procedures Manual: Guidance for Treatment of Petroleum-Contaminated Soil and Water and Standard Sampling Procedures*, *November 7, 2002*
- ADEC, *Draft Guidance on Developing Conceptual Site Models, March 24, 2005*

The contaminants of concern have been identified from a review of previous investigations (EPMI 1997, BGES 2004a, BGES 2004b, BGES 2005, and BGES 2007) and the results of this site characterization. The list includes the following contaminants:

- Chlorinated compounds – tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (DCE), trans-1,2-DCE, vinyl chloride, and chloroform
- Petroleum hydrocarbons – benzene, toluene, ethylbenzene, xylenes, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, gasoline range organics (GRO), and diesel range organics (DRO)
- Heavy metals – arsenic, barium, cadmium, and chromium

Analytical results for soil samples are evaluated using ADEC's Method Two guidelines as described in 18 AAC 75.341. Results are compared to soil cleanup levels (SCLs) of the "Under 40 Inch Zone" presented in Table B1. SCLs are based upon the most restrictive benchmark for either the migration to groundwater pathway, inhalation pathway, or ingestion pathway. Analytical results for groundwater samples are evaluated using ADEC's groundwater cleanup levels (GCLs) as presented in Table C of 18 AAC 75.345. Table 1 summarizes the SCLs and GCLs for the contaminants of concern.

TABLE 1. CONTAMINANT CLEANUP LEVELS

Compound	ADEC SCL (mg/kg)	ADEC GCL (mg/L)
PCE	0.024	0.005
TCE	0.020	0.005
cis-1,2-DCE	0.24	0.07
trans-1,2-DCE	0.37	0.1
Vinyl chloride	0.0085	0.002
Chloroform	0.46	0.14
Benzene	0.025	0.005
Toluene	6.5	1.0
Ethylbenzene	6.9	0.7
Xylenes	63	10
Naphthalene	20	0.73
1,2,4-trimethylbenzene	23	1.8
1,3,5-trimethylbenzene	23	1.8
GRO	300	2.2
DRO	250	1.5
Arsenic	3.9	NA
Barium	1,100	NA
Cadmium	5	NA
Chromium (Total)	25	NA

Note: Metals were not analyzed in water samples

1.4. Limitations

This site characterization has attempted to locate and quantify source areas of contamination and determine impact to groundwater downgradient of source areas. Based on limited resources and the extent of the area under investigation, there is no guarantee that sufficient data was collected to fully delineate all source areas or to fully delineate impact to groundwater.

Investigation activities were limited to locations where access was granted and free of underground utilities. Borings near underground utilities were located at least 5 feet from a utility to minimize the potential for breaching a line.

Much of the investigation strategy was based on field decisions made using field-generated data. The qualitative nature of field data may not allow for a full understanding of contaminant mass and distribution; therefore, field decisions may not be as informed as decisions made using more quantitative laboratory data.

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2. BACKGROUND

This section summarizes the environmental setting and previous investigations at the 4th and Gambell site. The environmental setting is based on information from existing investigation reports. Section 8 lists all referenced materials.

2.1. Environmental Setting

The following paragraph is taken from *Environmental Assessment* (EnviroAmerica 1993):

> Local site conditions may consist of alluvium in abandoned stream channels and in terraces along modern streams. Gravel and sand appears to be generally well bedded and well sorted. Deposits in large channels and in other broad areas are chiefly gravel and thicker than deposits in small narrow channels and terraces, which contain chiefly sand and gravel; some channels and broad areas may contain significant amounts of peat, silt or clay.

Drilling logs from soil borings installed at the site indicate that vadose zone soils are fine- to coarse-grained sands and gravel. The water table is located approximately 40 feet below ground surface (bgs), although the saturated zone appears to vary by as much as 5 feet. The groundwater flow direction has been mapped to the northeast. A layer of clay exists around 45 feet bgs and may serve as a confining layer for migration of contaminants (BGES 2005).

2.2. Previous Investigations

A Phase I environmental site assessment (ESA) was performed for the site in 1993. The Phase I ESA identified the operation of a C&K Cleaners from 1968 to 1970 and a Northern Commercial (NC) Tire Center from 1976 to 1978. C&K Cleaners appears to have been located on the western side of the property, and NC Tire Center appears to have been located on the eastern side of the property. The Phase I site reconnaissance indicated that an underground storage tank (UST) vent pipe was visible on the property. All buildings were removed from the site in 1978. The site has since served as a parking lot (EnviroAmerica 1993).

A Phase II ESA was performed in 1997. Trenches dug near the former C&K Cleaners unearthed a log crib with four empty drums marked for use in dry cleaning. A soil sample collected near the drums had a concentration of PCE of 3.2 parts per million (ppm). Seven hydraulic lifts, associated piping, sumps, an UST, and a log crib also were identified near the former NC Tire Center. Soil samples collected near the log crib had concentrations of PCE, ethylbenzene, toluene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, arsenic, barium, cadmium, and chromium above ADEC SCLs. Three monitoring wells (MW-1, EPM-2, and EPM-3) also were installed. No volatile organic compounds (VOCs) were detected in EPM-2 and EPM-3. The concentration of PCE in MW-1 was 4.25 ppm (EPMI 1997).

Another Phase II ESA was performed in August 2004, which included excavation of six test pits, removal of five hydraulic lifts, removal of four USTs, removal of soil contaminated with DRO above the SCL, and identification of monitoring well MW-1. The hydraulic lifts and USTs were associated with the former NC Tire Center operation. The contaminated soil came from underneath the hydraulic lifts and USTs. Concentrations of PCE above the SCL were detected in three of the test pits. These three test pits were located on the western side of the property near the location of the former cleaners (BGES 2004a).

Monitoring well MW-1 was sampled in October 2004. The sample was analyzed for VOCs by Environmental Protection Agency (EPA) method 8260. The concentration of PCE was 2.28 milligrams per liter (mg/L), which exceeds the ADEC GCL of 0.005 mg/L. All other compounds were less than laboratory reporting limits (BGES 2004b).

Three additional monitoring wells (MW-2, MW-3, and MW-4) were installed in March 2005. Soil samples were collected during drilling from various intervals and analyzed for VOCs. Concentrations of PCE ranged from 2,130 micrograms per kilogram (µg/kg) in the interval from 36 to 38 feet bgs in MW-4 to 79,500 µg/kg in the interval from 28 to 30 feet bgs in MW-2. All other compounds were less than laboratory reporting limits. PCE results for groundwater were 1.49 mg/L in MW-1, 0.0707 mg/L in MW-2, 1.79 mg/L in MW-3, and 0.372 mg/L in MW-4. All other compounds in groundwater were less than laboratory reporting limits. The conclusion was made that biodegradation of PCE was not occurring at a significant rate because of a lack of PCE daughter compounds and the oxygenated state of the aquifer (BGES 2005). However, it should be pointed out that dissolved oxygen (DO) was measured at ground surface in purge water obtained by the use of a bailer, which generally does not provide a representative measurement for DO.

A final assessment was performed in 2007. Five soil borings (A, C, D, E, and F) were drilled and three monitoring wells (MW-5, MW-6, and MW-7) were installed. Soil samples were collected from two or three intervals in all eight borings. Concentrations of PCE exceeded the SCL in all samples. Concentrations of PCE in groundwater exceeded the GCL of 0.005 mg/L in all three wells: 0.523 mg/L in MW-5, 0.822 mg/L in MW-6, and 0.0051 mg/L in MW-7 (BGES 2007).

Figure 2 shows the locations of soil borings and monitoring wells discussed in the paragraphs above.

3. FIELD ACTIVITIES

This section presents a summary of field activities performed as part of the site characterization. Appendix A contains a copy of field notes, and Appendix B presents photographs of field activities.

3.1. Soil Borings

OASIS subcontracted with GeoTek Alaska to drive six soil borings using direct-push drilling. The purpose of the soil borings was to investigate vadose zone contamination both upgradient and downgradient of the site. The locations for soil borings SB-2 through SB-5 had to be moved from the proposed locations of the work plan (OASIS 2008) because of conflicts with underground utilities. SB-6 also was moved because the presence of trees prevented drilling at the proposed location. Figure 3 presents the final locations for soil borings.

Continuous soil cores were collected by the direct-push drill rig during advancement of soil borings through the vadose zone. OASIS field personnel observed and documented soil characteristics of the cores; screened soil for the presence of VOCs using a photo-ionization detector (PID); screened soil for the presence of chlorinated alkenes using the Color-Tec method; and collected fixed-base laboratory confirmation samples if warranted. Appendix C contains boring logs for all six borings.

Every foot of soil core was screened with the PID. The screening occurred by splitting the core and shielding the PID probe tip within the split core with a dedicated sampling spoon. In addition, each 5 feet of soil core was screened for chlorinated alkenes by collecting increments every ½ foot so that one screening sample was comprised of ten increments. These screening samples were analyzed by the Color-Tec method.

Based on field screening results by Color-Tec, OASIS field personnel selected soil core intervals from which to collect confirmation soil samples. For all borings except SB-3 and SB-6, the interval with the highest Color-Tec reading was selected as well as the interval directly above the groundwater interface. For SB-6, only the interval directly above the groundwater interface was selected because Color-Tec results were non-detect for all intervals from ground surface to the water table. For SB-3, a third sample was collected because of the elevated Color-Tec results and the extra sample not used for SB-6.

In general, the length of the sample intervals were 5 feet, except for some of the intervals at the groundwater interface, which were shorter based on where the interface occurred in the 5-foot soil core. OASIS field personnel sampled the entire interval by collecting uniform increments of soil from ten locations within the sample interval. All soil samples were analyzed for VOCs by EPA method 8260B, GRO by Alaska Method AK101, and DRO by Alaska Method AK102. In addition, samples from soil boring SB-4 also were analyzed for Resource Conservation and Recovery Act (RCRA) metals (silver, arsenic, barium, cadmium, chromium, mercury, lead, and selenium) by EPA method 6010/7470.

Table 2 presents sample information for soil samples.

3.2. Groundwater Sampling

OASIS field personnel collected groundwater samples from both temporary wells and permanent monitoring wells to assess impact to groundwater. Table 2 contains sample information for groundwater samples.

3.2.1. Temporary Wells

Soil borings SB-1 and SB-2 were converted to temporary wells after drilling and soil sampling was complete. SB-1 was selected to serve as an upgradient monitoring point for the site. SB-2 was selected because the highest Color-Tec result for all soil borings occurred in the interval from 20 to 25 feet bgs.

GeoTek Alaska installed the temporary wells using direct-push drilling. The technique involves placing a 4-foot stainless steel screen within the leading drill rod. After reaching the desired depth, the drill rod is pulled back while holding the screen in place to create a temporary well. The depth of the temporary well in SB-1 was 45 feet. The depth of the temporary well in SB-2 was 52 feet, which was 5 feet deeper than planned; however, at 47 feet the well was not producing, so the OASIS field team leader directed GeoTek Alaska to drive the well point another 4 feet into the saturated zone.

The wells were sampled by placing dedicated tubing into the drill rod and using a hand pump with a check valve to pull water to the surface. The temporary wells were purged until turbidity decreased to a consistent level based on visual observation. Samples were collected for VOCs by EPA method 8260B, GRO by Alaska Method AK101, and DRO by Alaska Method AK102 by filling the sample bottles directly from the dedicated tubing.

3.2.2. Monitoring Wells

OASIS field personnel sampled existing monitoring wells MW-5 and MW-6. The wells were sampled using a bladder pump with dedicated sample tubing and low-flow sampling techniques. Water quality parameters of the purge water were monitored using a flow-through cell. Samples were collected when water quality parameters stabilized. Samples were analyzed for VOCs by EPA method 8260B, GRO by Alaska Method AK101, and DRO by Alaska Method AK102.

3.3. Work Plan Deviations

OASIS prepared *Site Characterization Work Plan, 4th and Gambell* (OASIS 2008), which outlined the strategy and methodology for the collection of soil and groundwater samples. Some of the executed activities and details deviated from the plan:

- Soil borings SB-2 through SB-6 were moved because a water main and service lines precluded using the proposed locations. The borings were moved the minimal distance necessary from their proposed locations in order to be clear of the water utilities.

- Soil boring SB-1 was moved because the proposed location was within a stand of trees such that the drill rig could not work without damaging the trees. The new location was approximately 25 feet east of the proposed location.
- Boring SB-6 was not driven to the groundwater interface because the drill rig was meeting extreme resistance at 35 feet bgs. The OASIS field team leader decided to end the boring at that depth instead of continuing to attempt to drive 5 feet further.
- Only one soil sample was collected from boring SB-6 because all Color-Tec results were non-detect. Therefore, the OASIS field team leader decided to collect a single sample at the groundwater interface and save the extra sample for an additional boring, which was used in boring SB-3.
- The temporary well point at SB-2 had to be set approximately 10 feet into the saturated zone, as opposed to 5 feet, in order to achieve production from the well.

3.4. Investigation-Derived Waste

Site characterization field activities generated solid and aqueous investigation-derived waste (IDW). Solid IDW included unused soil cores and used personal protective equipment (PPE) and sampling equipment, such as disposable nitrile gloves, sample sleeves, sample tubing, and field test reagent kits. Unused soil cores were placed back down abandoned test borings, and GeoTek Alaska filled the remaining annular space of abandoned test borings with a bentonite grout to seal the borings. Used PPE and sampling equipment were contained in trash bags and disposed of at the Anchorage landfill. Spent Color-Tec tubes were contained in a plastic bag and disposed of at the Anchorage landfill as small quantity-exempt/household hazardous waste.

Aqueous IDW included purge water from temporary and monitoring wells and decontamination fluids. These wastes were contained in a 55-gallon drum. OASIS field personnel collected a waste profile sample from the drum. Analytical results for the profile sample were less than RCRA threshold values for characteristic waste. OASIS coordinated with Emerald Alaska, the IDW subcontractor, for pickup, transport, and disposal of the drum containing aqueous IDW.

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4. FINDINGS

This section discusses the results of the site characterization and includes tables and figures that show analytical results for soil and groundwater samples. Appendix D contains a copy of laboratory analytical data reports.

4.1. Soil Sampling

This subsection discusses results for soil samples collected from six soil borings driven at the site. Table 3 presents field screening and analytical results for all soil samples.

4.1.1. Color-Tec Sample Analytical Results

Soil borings SB-2, SB-3, SB-4, and SB-5 had soil samples from the vadose zone with detectable responses. The maximum result for Color-Tec analysis (70 ppm) occurred in boring SB-2 within the interval from 20 to 25 feet bgs. Borings SB-2, SB-3, and SB-4 all had detectable responses from the ground surface to the groundwater interface, although results from borings SB-2 and SB-3 seem to be greater than results from SB-4. The peak results for these three borings generally occurred within the interval from 15 to 35 feet bgs.

Boring SB-5 had no detectable response for the initial 10 feet of soil. After that depth, however, low responses occurred for Color-Tec analysis to the groundwater interface around 40 feet bgs. Therefore, the source area that occurs around borings SB-2, SB-3, and SB-4 appears to extend northward to SB-5, although it appears that SB-5 may be close to the northern extent of the soil contamination. Borings SB-1 and SB-6 had no detectable responses for Color-Tec analysis, and therefore, appeared to be outside the area of impacted soil at the time of field screening.

4.1.2. Confirmation Soil Sample Results

Twelve confirmation soil samples were collected from the six soil borings. Nine of the samples were collected to confirm positive responses of Color-Tec analysis in borings SB-2, SB-3, SB-4, and SB-5, and the other three samples were collected to confirm non-detect responses of Color-Tec analysis in borings SB-1 and SB-6. Figure 3 shows concentrations of PCE from all 12 confirmation soil samples in addition to corresponding Color-Tec results.

Analytical results for confirmation soil samples mostly correlate with the field analytical results by Color-Tec. Borings SB-2 and SB-3 had the highest concentrations of PCE: PCE was detected at 45,000 µg/kg in SB-2 within the interval from 24 to 29 feet bgs and at 54,000 µg/kg in SB-3 within the interval from 20 to 25 feet bgs. Boring SB-4 also had an elevated concentration of 9.3 µg/kg within the interval from 24 to 29 feet bgs. Similar to Color-Tec results, PCE concentrations in boring SB-5 (840 µg/kg and 1,600 µg/kg) were appreciably less than concentrations in SB-2, SB-3, and SB-4, but nonetheless the concentrations were well above the SCL of 24 µg/kg.

PCE was not detected in the two samples within the intervals from 4 to 9 feet bgs and 34 to 38 feet bgs from SB-1. PCE was detected within the interval from 32.5 to 35 feet bgs for SB-6 at 240 µg/kg; this was the only false correlation that occurred with Color-Tec analysis (Color-Tec result was non-detect).

GRO and DRO were not detected in any of the confirmation soil samples, and field screening with a PID did not indicate the potential presence of hydrocarbons. Barium and total chromium were the only metals detected in confirmation soil samples from boring SB-4; however, the concentrations of barium and total chromium do not appear to vary from typical background concentrations found in the Anchorage area.

4.2. Groundwater Sampling

Table 4 presents analytical results for groundwater samples collected from monitoring wells MW-5 and MW-6 and temporary wells at soil borings SB-1 and SB-2. The analytical results also are included in Figure 4.

PCE was detected at 290 micrograms per liter (µg/L) and 1,600 µg/L in monitoring wells MW-5 and MW-6, respectively. Both of these results exceed the GCL of 5 µg/L. PCE was the only compound detected in monitoring wells MW-5 and MW-6, although laboratory reporting limits were elevated because of the PCE concentrations.

Only chloroform was detected in the upgradient temporary well at SB-1, but the concentration was less than the GCL. PCE was detected at a concentration of 320 µg/L in the temporary well at SB-2. No other compounds were detected in SB-2.

5. QUALITY ASSURANCE REVIEW

This section summarizes the results of a data review using ADEC's (2008) *Environmental Laboratory Data and Quality Assurance Requirements* to determine data quality and to evaluate potential impact on the usability of the data. The review was performed using EPA Level II laboratory data reports that were provided by OnSite Environmental. Laboratory analytical reports are provided in Appendix D. ADEC data review checklists are included in Appendix E.

The following list provides a brief review of data quality objectives. More details are presented in Appendix F.

- All work was performed by OASIS or subcontractor personnel who are qualified individuals as per 18 AAC 75.990(100).
- Completeness – 100% of samples submitted were analyzed, thereby meeting the data quality objective of 95%.
- Accuracy – All primary, matrix spike/matrix spike duplicate (MS/MSD), laboratory control, and method blank samples met method criteria for surrogate recoveries.
- Precision – Relative percent differences (RPDs) for one of the blind field duplicate soil samples was less than the 50 percent threshold for soil analysis; however, the other blind field duplicate pair (084AG105SB and 084AG106SB) had a RPD greater than 50% for PCE. These results have been flagged as estimated because of the discrepancy. RPDs for the blind field duplicate groundwater sample were less than the 30 percent threshold for water analysis. RPDs for MS/MSD samples and laboratory control samples also met the criteria. All laboratory method blanks were non-detect for contaminants of concern.
- Comparability – Samples were collected and analyzed in a manner that allowed analytical results to be compared to each other.
- Representativeness – Water samples were collected in a manner that minimally disturbed the water column and retrieved the sample matrix from the desired depth. Soil samples were collected from soil cores with minimal disturbance. Sample material was added to sample containers pre-preserved with methanol to hold potential contaminants in solution. Analysis of trip blank samples indicated that no cross-contamination occurred for soil and groundwater samples during the project.

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6. CONCEPTUAL SITE MODEL

The contaminants of concern, already mentioned in Section 1.3, have been identified from a review of previous investigations (EPMI 1997, BGES 2004a, BGES 2004b, BGES 2005, and BGES 2007) and the results of this site characterization. The list includes the following contaminants:

- Chlorinated compounds – PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride, and chloroform
- Petroleum hydrocarbons – benzene, toluene, ethylbenzene, xylenes, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, GRO, and DRO
- Heavy metals – arsenic, barium, cadmium, and chromium

The following tables present a human health conceptual site model (CSM) for the contaminants of concern at the 4th and Gambell site. Appendix F contains a copy of ADEC's CSM Scoping Form and Human Health CSM for the site. The CSM Scoping Form was used to generate the Human Health CSM form and Table 5.

TABLE 5. CONCEPTUAL SITE MODEL SUMMARY, 4TH AND GAMBELL, ANCHORAGE, ALASKA

Elements of CSM	Site Specific Factors
Source	Underground storage tanks; aboveground storage tanks; drums (containers) of product
Release Mechanism	Spills; leaks; direct discharges
Impacted Media	Surface soil; subsurface soil
Transport Mechanism	Migration or leaching to subsurface; migration or leaching to groundwater; volatilization; flow to surface water; flow to sediment; sedimentation; resuspension, runoff, erosion
Exposure Media	Soil, groundwater, air, surface water, sediment
Exposure Routes	Ingestion of soil and groundwater; inhalation of outdoor air and indoor air
Receptors	Residents; commercial or industrial workers; site visitors; construction workers

The pathways shown in Table 6 for current and future receptors are considered complete at this time for contaminants of concern because the pathways are complete or may become complete in the future based on potential development or use.

TABLE 6. COMPLETE RECEPTOR PATHWAYS, 4TH AND GAMBELL, ANCHORAGE, ALASKA

Residents	Site Worker	Site Visitor	Construction Worker	Subsistence
Incidental Soil Ingestion	Incidental Soil Ingestion	Incidental Soil Ingestion	Incidental Soil Ingestion	None
Ingestion of Groundwater	Ingestion of Groundwater	Ingestion of Groundwater	Ingestion of Groundwater	
Inhalation of Outdoor Air	Inhalation of Outdoor Air	Inhalation of Outdoor Air	Inhalation of Outdoor Air	
Inhalation of Indoor Air	Inhalation of Indoor Air	Inhalation of Indoor Air	Inhalation of Indoor Air	

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7. SUMMARY

OASIS conducted a site characterization of the 4th and Gambell site on behalf of ADEC in July 2008. The site characterization included drilling six soil borings, field screening soil from the borings, collecting confirmation soil samples from the borings, sampling two monitoring wells, and sampling two temporary wells. The following subsections discuss investigative conclusions and recommendations for future actions.

7.1. Conclusions

Analytical results for soil borings SB-2, SB-3, SB-4, and SB-5 indicate an area of PCE-impacted soil that is north of the location of the former C&K Cleaners. Contamination is present at ground surface in the areas of SB-2, SB-3, and SB-4, but the significant mass of contamination occurs in a gravelly sand profile that begins around 15 feet bgs and extends to approximately 35 feet bgs. The contamination seems to be the result of deposition and/or migration from a product release or releases rather than precipitation from volatilizing groundwater because field screening concentrations were less near the groundwater interface (approximately 40 feet bgs) than concentrations in the interval from 20 to 30 feet bgs.

Field screening of soil samples from SB-6 did not indicate the presence of PCE, but the analytical result of a soil sample from the bottom of the boring had a concentration of PCE greater than the SCL. Therefore, it appears that impact to soil extends to the corner of the block where SB-6 is located. Given the low concentration of PCE and the lack of detection of PCE above the sampled interval, it is possible that the analytical result in the confirmation sample is caused by precipitation from volatilization of contaminated groundwater.

Figure 5 depicts a conceptual model of the distribution area of PCE-contaminated soil at the 4th and Gambell site. The distribution was inferred using the results of this site characterization and analytical results from previous investigations. As illustrated in Figure 5, the extent of PCE contamination in the vadose zone is broad, but the exact boundaries are unknown at this point in the characterization process.

Analytical results from groundwater samples collected at monitoring and temporary wells during this site characterization and analytical results from groundwater samples collected during previous investigations demonstrate that the PCE exceeds the GCL underneath the entire area of the former C&K Cleaners. The plume appears to extend northeastward, which is the reported direction of local groundwater flow. Based on the elevated PCE concentration in MW-2 and MW-6, the plume likely extends west of Gambell Street and north of 3rd Avenue, respectively. The absence of PCE or other significant concentrations of VOCs in temporary well SB-1 indicates that no upgradient source is contributing to contamination at the 4th and Gambell site.

7.2. Recommendations

The following recommendations are provided to further investigate and understand the presence and movement of PCE at the 4th and Gambell site. The recommendations serve as options for ADEC to consider in future project planning. ADEC is not obligated to enact or implement any or all of the recommendations.

- Delineate the boundaries of PCE contamination in the vadose zone by drilling additional borings.
- Define the extent of PCE contamination in groundwater with a series of temporary wells.
- Install additional monitoring wells along the boundaries of the plume for monitoring of plume conditions, including natural attenuation parameters.
- Assess the air pathway for human receptors by conducting vapor intrusion assessments at the residences north of the site along 3rd Avenue.

The findings from these additional investigative actions will assist in developing a corrective action strategy for the 4th and Gambell site. Given the elevated PCE concentrations in soil and groundwater so near the residences north of the site along 3rd Avenue, OASIS recommends skipping exterior soil gas sampling and proceeding directly to interior vapor intrusion assessments because of the high likelihood that vapor intrusion is occurring in these residences.

8. REFERENCES

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TABLES

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Table 2
Sample Summary
4th and Gambell Site Characterization

Sample ID	Date	Sample Location	Analyses				Comments
			VOCs	GRO	DRO	Metals	
084AG101GW	7/24/2008	MW-6	✔	✔	✔		
084AG102GW	7/24/2008	MW-6	✔	✔	✔		Duplicate of 084AG101GW
084AG103SB	7/24/2008	SB-6	✔	✔	✔		
084AG104GW	7/24/2008	MW-5	✔	✔	✔		
084AG105SB	7/24/2008	SB-3	✔	✔	✔		
084AG106SB	7/24/2008	SB-3	✔	✔	✔		Duplicate of 084AG105SB
084AG107SB	7/24/2008	SB-3	✔	✔	✔		
084AG108SB	7/24/2008	SB-3	✔	✔	✔		
084AG109SB	7/25/2008	SB-4	✔	✔	✔	✔	
084AG110SB	7/25/2008	SB-4	✔	✔	✔	✔	
084AG111SB	7/25/2008	SB-1	✔	✔	✔		
084AG112SB	7/25/2008	SB-1	✔	✔	✔		
084AG113GW	7/25/2008	SB-1	✔	✔	✔		
084AG114SB	7/25/2008	SB-5	✔	✔	✔		
084AG115SB	7/25/2008	SB-5	✔	✔	✔		Duplicate of 084AG115SB
084AG116SB	7/25/2008	SB-5	✔	✔	✔		
084AG117SB	7/25/2008	SB-2	✔	✔	✔		
084AG118SB	7/25/2008	SB-2	✔	✔	✔		
084AG119TB	7/25/2008	NA	✔				Trip blank for soil samples
084AG120TB	7/25/2008	NA		✔			Trip blank for soil samples
084AG121TB	7/25/2008	NA	✔	✔			Trip blank for water samples
084AG122GW	7/25/2008	SB-2	✔	✔	✔		
084AG123WA	7/25/2008	IDW Drum	✔				Drum Sample

Key:
DRO = Diesel range organics
GRO = Gasoline range organics
VOC = Volatile organic compound

Table 3
Soil Boring Analytical Results
4th and Gambell Site Characterization

Boring	Sample Depth	Sample Number	Color-Tec (ppm)	PCE (µg/kg)	1,3,5-TMB (µg/kg)	1,2,4-TMB (µg/kg)	Naphthalene (µg/kg)	GRO (mg/kg)	DRO (mg/kg)	Barium (mg/kg)	Chromium (mg/kg)
SB-1	0-4 ft	---	ND	---	---	---	---	---	---	---	---
	4-9 ft	084AG112SB	ND	ND (20)	ND (20)	ND (20)	ND (20)	ND (1.9)	ND (10)	---	---
	9-14 ft	---	ND	**---**	---	---	---	---	---	---	---
	14-19 ft	---	ND	**---**	---	---	---	---	---	---	---
	19-24 ft	---	ND	**---**	---	---	---	---	---	---	---
	24-29 ft	---	ND	**---**	---	---	---	---	---	---	---
	29-34 ft	---	ND	**---**	---	---	---	---	---	---	---
	34-38 ft	084AG111SB	ND	ND (31)	ND (31)	ND (31)	ND (31)	ND (3.3)	ND (11)	---	---
SB-2	0-5 ft	---	0.1	---	---	---	---	---	---	---	---
	5-10 ft	---	0.9	**---**	---	---	---	---	---	---	---
	10-15 ft	---	5	**---**	---	---	---	---	---	---	---
	15-20 ft	---	25	**---**	---	---	---	---	---	---	---
	20-25 ft	084AG118SB	70	**45,000**	ND (23)	ND (23)	ND (23)	ND (2.4) Z	ND (11)	---	---
	25-30 ft	---	18	**---**	---	---	---	---	---	---	---
	30-35 ft	---	60	**---**	---	---	---	---	---	---	---
	35-40 ft	---	8	**---**	---	---	---	---	---	---	---
	36-41ft	084AG117SB	8	**16,000**	77	140	27	ND (2.4) Z	ND (11)	---	---
SB-3	0-4 ft	---	>3	---	---	---	---	---	---	---	---
	4-9 ft	---	1.7	**---**	---	---	---	---	---	---	---
	9-14 ft	---	5	**---**	---	---	---	---	---	---	---
	14-19 ft	---	7	**---**	---	---	---	---	---	---	---
	19-24 ft	---	18	**---**	---	---	---	---	---	---	---
	24-29 ft	084AG105SB	30	**54000 JF**	ND (20)	ND (20)	ND (20)	ND (1.9) Z	ND (11)	---	---
	duplicate	084AG106SB	---	**20000 JF**	ND (23)	ND (23)	ND (23)	ND (2.0) Z	ND (11)	---	---
	29-34 ft	084AG107SB	19	**9,900**	ND (25)	ND (25)	ND (25)	ND (2.6) Z	ND (11)	---	---
	34-39 ft	---	4	**---**	---	---	---	---	---	---	---
	39-41 ft	084AG108SB	9	**4,000**	ND (20)	ND (20)	ND (20)	ND (3.0)	ND (11)	---	---
SB-4	0-4 ft	---	0.8	---	---	---	---	---	---	---	---
	4-9 ft	---	0.7	**---**	---	---	---	---	---	---	---
	9-14 ft	---	4	**---**	---	---	---	---	---	---	---
	14-19 ft	---	2.0	**---**	---	---	---	---	---	---	---
	19-24 ft	---	2.5	**---**	---	---	---	---	---	---	---
	24-29 ft	084AG109SB	12	**9,300**	ND (21)	ND (21)	ND (21)	ND (2.2) Z	ND (10)	19	18
	29-34 ft	---	12	**---**	---	---	---	---	---	---	---
	34-39 ft	---	1.0	**---**	---	---	---	---	---	---	---
	39-41.5 ft	084AG110SB	1.7	**2,900**	ND (27)	ND (27)	ND (27)	ND (2.8)	ND (10)	35	24
		ADEC SCL	**---**	**24**	**23,000**	**23,000**	**20,000**	**300**	**250**	**1,100**	**25**

Table 3
Soil Boring Analytical Results
4th and Gambell Site Characterization

Boring	Sample Depth	Sample Number	Color-Tec (ppm)	PCE (µg/kg)	1,3,5-TMB (µg/kg)	1,2,4-TMB (µg/kg)	Naphthalene (µg/kg)	GRO (mg/kg)	DRO (mg/kg)	Barium (mg/kg)	Chromium (mg/kg)
SB-5	0-4 ft	---	ND	---	---	---	---	---	---	---	---
	4-9 ft	---	ND	**---**	---	---	---	---	---	---	---
	9-14 ft	---	ND	**---**	---	---	---	---	---	---	---
	14-19 ft	---	0.4	**---**	---	---	---	---	---	---	---
	19-24 ft	084AG114SB	1.9	**840**	ND (23)	ND (23)	ND (23)	ND (2.5)	ND (10)	---	---
	duplicate	084AG115SB	---	**1,000**	ND (23)	ND (23)	ND (23)	ND (2.4)	ND (10)	---	---
	24-29 ft	---	1.7	**---**	---	---	---	---	---	---	---
	29-34 ft	---	0.8	**---**	---	---	---	---	---	---	---
	34-39 ft	084AG116SB	0.6	**1,600**	ND (22)	ND (22)	ND (22)	ND (2.7)	ND (10)	---	---
SB-6	0-5 ft	---	ND	---	---	---	---	---	---	---	---
	5-10 ft	---	ND	**---**	---	---	---	---	---	---	---
	10-15 ft	---	ND	**---**	---	---	---	---	---	---	---
	15-20 ft	---	ND	**---**	---	---	---	---	---	---	---
	20-25 ft	---	ND	**---**	---	---	---	---	---	---	---
	25-30 ft	---	ND	**---**	---	---	---	---	---	---	---
	30-35 ft	---	ND	**---**	---	---	---	---	---	---	---
	32.5-35 ft	084AG103SB	NR	**260**	ND (32)	ND (32)	ND (32)	ND (2.4)	ND (10)	---	---
		ADEC SCL	**---**	**24**	**23,000**	**23,000**	**20,000**	**300**	**250**	**1,100**	**25**

Note: Value in parenthesis is the laboratory reporting limit.
Bolded value indicates result exceeds ADEC SCL.

Key:
ADEC = Alaska Department of Environmental Conservation
DCE = Dichloroethene
DRO = Diesel-range organics
ft = Feet
GRO = Gasoline-range organics
JF = Result is an estimate due to failed relative percent difference limits between the primary sample and its field duplicate
µg/kg = Micrograms per kilogram
mg/kg = Milligrams per kilogram
ND = Not detected
NM = Not measured
PCE = Tetrachloroethene
ppm = Parts per million
SCL = Soil cleanup level
TCE = Trichloroethene
TMB = Trimethylbenzene
Z = The laboratory reported a GRO result above the PQL, however, it is a single peak and is attributed to the presence of PCE.

Table 4
Groundwater Analytical Results
4th and Gambell Site Characterization

Analyses	Compound	Units	ADEC GCL	Groundwater Samples				
				MW-5	MW-6		SB-1	SB-2
				084AG104GW	084AG101GW	084AG102GW	084AG113GW	084AG122GW
Volatile Organic Compounds								
	Chloroform	µg/L	140	ND (2.0)	ND (10)	ND (10)	6.1	ND (2.0)
	PCE	µg/L	5	**290**	**1,600**	**1,600**	ND (0.2)	**320**
Alaska Hydrocarbons								
	GRO	mg/L	2.2	ND (0.1)	ND (0.1) Z	ND (0.1) Z	ND (0.1)	ND (0.1)
	DRO	mg/L	1.5	ND (0.25)	ND (0.24) SG	ND (0.26) SG	ND (0.25) SG	ND (0.24) SG

Note: Value in parenthesis is the laboratory reporting limit.

Key:

ADEC = Alaska Department of Environmental Conservation
DRO = Diesel range organics
GCL = Groundwater cleanup level
GRO = Gasoline range organics
µg/L = Micrograms per liter
mg/L = Milligrams per liter
ND = Not detected
PCE = Tetrachloroethene
SG = The laboratory treated the sample extracts with silica gel.
Z = The laboratory reported a GRO result above the PQL, however, it is a single peak and is attributed to the presence of PCE.

FIGURES

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APPENDIX A

Field Notes

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4th + GAMBELL

SITE CHARACTERIZATION

"Rite in the Rain"®

ALL-WEATHER

FIELD

No. 353

14139

CONTENTS

14-139 4th + Gambell 7/23/08 (1)

1015 OASIS Ben Merdich (BM) + Jessika Gonzeke on s.te for utility locates. Meet with AWWU + Enstar. MLP, ACS have already marked. At this time only the alley between s.te + homes appear to be an issue b/c of water main + secondary lines + a gas line. Jessika remains to complete locates while BM visits with Vicki Nickelich, property owner for SB-2 location where SB-2 is. She says that we can drill, but Thursday + Friday may be bad timing b/c she has delivery trucks coming at her house. Will try to work around that, but may have to push drilling off until Saturday.

1045 BM departs s.te while JG finishes locates.

7/24/08 4th + Gambell 14-139

0830 OASIS Craig Scott (CS) + Ben Mortick (BM) arrive at site. Review + sign HSE Plan. Awaiting arrival of GeoTek.

0840 BM checks secondary ties near SB-4. Appears water line runs north to northeast from SB-4. Move tree@ location of SB-4 to NW of keybox.

0850 AWWU arrives at site to check locations for SB-2, SB-3, SB-4.

0900 GeoTek arrives at site. Driller is Russell. Driller's helper is Jeff.

0945 GeoTek sets up at SB-6. Begin drilling. Plan is to collect continuous cores from ground surface to ~40 ft. Final depth will be dependent on location of groundwater.

1000 GeoTek had to perform some maintenance on rig. Just now starting.

1050 First soil core is on table. CS screens with PID; BM collects Color-Tec; CS logs core.

1230 Only have driven 25 feet at this point. Displacement has been very difficult. GeoTek believes the hole is collapsing.

BM 7/24/08

14-139 4th + Gambell 7/24/08

after withdrawal of drill rod. Scott Lofts says he will bring in a larger drilling rig which should assist in displacement.

1330 BM calls ADEC Todd Blessing who was planning on coming out at 1400. Tell him that today may not be good to observe b/c of our drilling problems. So they will come out tomorrow at 10:00.

1430 BM + CS Initiate well sampling at MW-6. Using a bladder pump with control box and air compressor. Using a YSI flow through cell to monitor parameters.

1505 Parameters stabilize

pH = 6.41 cond = 0.676 mS/cm

temp = 7.80°C DO = 2.97 mg/L ORP = 191.5 mV

1515 Collect sample 084AG101GW from MW-6. 5 40ml VOAs for GRO + VOCs. Two 1-L ambers for DRO. Also collect duplicate sample 084AG102GW. Same bottles as ~~previous~~ 101GW. Time listed as 1545.

1545 Set up at MW-5. Purge low-flow style with bladder pump.

BM 7/24/08

(4)

7/24/08 4th + Gumbell 14-135

1600 GeoTek gets refusal at ~35 ft in SB-6. BM makes decision to abandon SB-6 at 35 ft instead of spending extra time to get 5 more feet. Will now use GeoTek's 8040 rig which should eliminate refusal issue. BM also decides to collect only one sample from SB-6 b/c of lack of detections in borings by field screening.

1615 Collect sample from 32.5-35 ft. 084AG-103SS One 4oz w/methanol for VOCs. One 4-oz jar (amber) w/methanol for GRO. One 4oz jar (amber) for DRO.

Note: Since only one sample from SB-6, we have an extra sample to use elsewhere if necessary.

1630 Take water quality readings at MW5 b/c parameters have stabilized

pH = 6.62 cond = 0.575 ms/cm

temp = 8.41°C DO = 2.46 mg/L ORP = 217 mV

1635 Collect sample 084AG104GW from MW5. 5 40-ml VOA w/HCl vials for VOCs & GRO. 2 1-L ambers w/HCl for DRO.

BM 7/24/08

(5)

14-135 4th + Gumbell 7/24/08

1645 Begin drilling SB-3.

1915 Complete SB-3

1925 Collect sample 084AG105SB from 24-29 ft in SB-3. One 4oz amber jar w/methanol for VOCs. One 4oz amber jar w/methanol for GRO. One 4-oz amber jar for DRO. Also collect duplicate sample 084AG106SB from 24-29 ft in SB-3. Send analyses Sample time is 1930

1935 Collect sample 084AG107SB from 29-34 ft in SB-3. One 4-oz amber jar w/methanol for VOCs. One 4-oz amber jar w/methanol for GRO. One 4-oz amber jar for DRO.

1940 Collect sample 084AG108SB from 39-41 ft interval in ~~SB-4~~ SB-3. One 4oz amber jar w/methanol for VOCs. One 4oz amber jar w/methanol for GRO. One 4-oz amber jar for DRO.

BM 7/24/08

⑥

7/24/08 4th + Cambell

14-139

Sample Summary for 7/24

Sample	Boring/well	Time	Analyses	Interval	Notes
084AG1016GW	MW-6	1515	VOC, GRO, DRO	NA	
1026GW	MW-6	1545	"	NA	Dupe of 1016GW
1035SB	SB-6	1615	"	32.5-35	
1046GW	MW-5	1635	"	NA	
1055SB	SB-3	1925	"	24-29	
1065SB	SB-3	1930	"	24-29	Dupe of 1055SB
1075SB	SB-3	1935	"	29-34	
1085SB	SB-3	1940	"	39-41	

BM

2015 Speak w/ Vojtek. We core ~ 80 ft of drilling today. All macro-core.

2020 Departed site. Arrived at office. Drained equip & set up for tomorrow

2040 Depart office for home

BM 7/24/08

⑦

14-139 4th + Cambell 7/25/08 ~~7/24/08~~

0645 BM calibrates PID #36. Same unit we used yesterday. Calibration log is kept with instrument.

0730 BM + CS arrive on site. GeoTek is setting up. We get our sample table set up. BM + CS have morning safety meeting. Discuss hazards for day + ways to reduce potential incidents. BM also has meeting w/ GeoTek.

0805 Begin drilling SB-4.

1010 ADEC Todd Blessing and other staff arrive at site to observe Color-Tec ed sample procedures.

1040 ADEC staff depart.

1050 Complete boring SB-4. Conductor at approximately 41.5 ft bgs.

1055 Collect sample 084AG1095B from 24-29 ft bgs. One 4oz amber jar w/ methanol for VOCs. One 4-oz amber jar w/ methanol for GRO. One 4oz amber jar for DRO and RCRA metals.

1105 Collect sample 084AG1105B from 39-41.5 ft bgs. One 4-oz amber jar w/ methanol for VOCs. One 4-oz amber jar w/ methanol for GRO. One 4oz amber jar for DRO.

BM 7/24/08 Note in the file

~~7/24/08~~ 7/25/08 4th & Gambrill 14-139

1115 Break for lunch while GeoTek re-tools for next location (SB-1).

1235 Begin drilling SB-1 on west side of Burger Jim's. ROW permit is posted on drilling rig and traffic control is established for the sidewalk.

1335 Completed first 24 feet of SB-1. Note about Color-Tec. It appears we have been getting some blank contamination in the first four intervals (<0.5 ppm response) b/c a blank sample of DI water also had a similar response. Changed out all hardware on the Color-Tec and the fifth interval (19-24 ft) was truly ND. Based on these findings, the first 4 intervals also are decided to be "ND". Will sample one of them to verify this judgment.

1430 Observe water at 38 ft bgs in SB-1. Decide to collect soil samples from 4-9 and 34-38 ft. GeoTek begins setting SP point at SB-1. Screen interval will be 41-45 ft.

1485 Collect sample 084AG1128 from 34-38 ft in SB-1. One 4oz jar w/methanol for

14-139 4th & Gambrill 7/25/08

VOCs. One 4-oz jar (amber) w/methanol & GRO. One 4oz amber jar for DRO.

1440 Collect sample 084AG1125B from 4-9 ft interval in SB-1. One 4oz jar (amber) w/methanol for VOCs one 4oz amber jar w/methanol for GRO. One 4oz amber jar for DRO.

1450 GeoTek crew on team splits. Russell will use 6620 to drive temporary well at SB-1, while Vojta will use 8040 to begin drilling SB-5.

1535 Begin drilling SB-5.

~~1710~~

1680 CS collects sample 084AG113GW from temporary well at SB-1. 8 40-ml VOA vials w/HCl for VOCs + GRO. 4 1-L ambers w/HCl for DRO. This is MS/MSD sample.

1710 BM calls Sherman Traffic Control to let them know that we are done with Traffic Control.

1720 GeoTek begins drilling SB-2 with 6620 rig while 8040 finishes up SB-5.

7/25/08

(10)

7/25/08 — 4th + Gumball — 14-139

1740 Collect sample 084AG1145SB from ~~24-29 ft interval in~~ (2) 19-24 ft interval in SB-5. One 4oz amber jar w/methanol for VOCs. One 4-oz amber jar w/methanol for GRO. One 4-oz amber jar for DRO. Also collect duplicate 084AG1155SB from 19-24 ft interval. Same analyses. Time started @ 1800

1825 8040 drill rig moves from SB-5 to SB-2. 6620 rig got first 20 ft 8040 will finish

1530 Collect sample ~~084AG1155SB DUPR~~ (3) (4) 084AG1165SB from 34-39 ft interval of SB-5. One 4oz amber jar w/methanol for VOCs. One 4oz amber jar w/methanol for GRO. One 4oz amber jar for DRO. Note that water table was somewhere in the 39-44 ft interval b/c this core was looking wet the end of the barrel. However, Geotek was not able to extract the core from the barrel so we had to sample 34-39 ft interval to represent the area just above the water table.

RM 7/25/08

(11)

14-139 — 4th + Gumball — 7/25/08

Sample Summary for 7/25

Sample	Boring/well	Time	Analyses	Interval	Notes
084AG1095B	SB-4	1055	VOC, GRO, DRO, metals	24-29	
1105B	SB-4	1105	"	39-41.5	
1115B	SB-1	1435	VOC, GRO, DRO	34-38	
1125B	SB-1	1440	"	4-9	
1135GW	SB-1	1630	"	41-45	MS/MSD
1145B	SB-5	1740	"	19-24	
1155B	SB-5	1800	"	19-24	dupe of 1145B
1165B	SB-5	1830	"	34-39	
1175B	SB-2	1950	"	36-41	
1185B	SB-2	1955	"	20-25	
119TB			VOC		VOC soil trip blank
~~1195~~ (5)					(6)
120TB			GRO		GRO soil trip blank
121TB			VOC, GRO		VOC/GRO water TB
122GW	SB-2	2140	VOC, GRO, DRO	48-52	
123WA	Drum	2155	VOCs		Drum Sample

~~1950~~ 1940 (7) Collect sample 084AG1175B from 36-41 ft interval in SB-2. One 4oz jar (amber) w/methanol for VOCs. One 4-oz jar (amber) w/methanol for GRO. One 4oz amber jar for DRO.

RM 7/25/08

"Rain in the P..."

(12)

7/25/08 4th + Gambell 14-139

1455 Collect sample 084AG11853 ~~084AG11853~~ from 20-25 ft interval in SB-2. One 4oz amber jar w/methanol for VOCs. One 4-oz amber jar w/methanol for GRO. One 4oz amber jar for DRO.

2000 Since SB-2 had the highest Color-Tec reading (20-25 ft interval) will set the 2nd temp well here. Screen interval will be 43-47 ft bgs.

2030 AM drops SC off at office. He is finished for day.

2040 AM returns to site to begin purging temporary well at SB-2. Well is dry from 43-47 ft. Will reset it from 48-52 ft.

2120 GeoTek resets temp well at 48-52 ft. Begin purging well. Well cleared up + sampled

2140 AM collects sample 084AG12200 from temp well at SB-2. 5 40ml VOA vials w/HCl for VOCs, GRO. Two 1-L ambers w/HCl for DRO.

2155 BM collects sample 084AG12304 from drum of purge water + clean water. Three 40ml VOA vials w/HCl for VOCs.

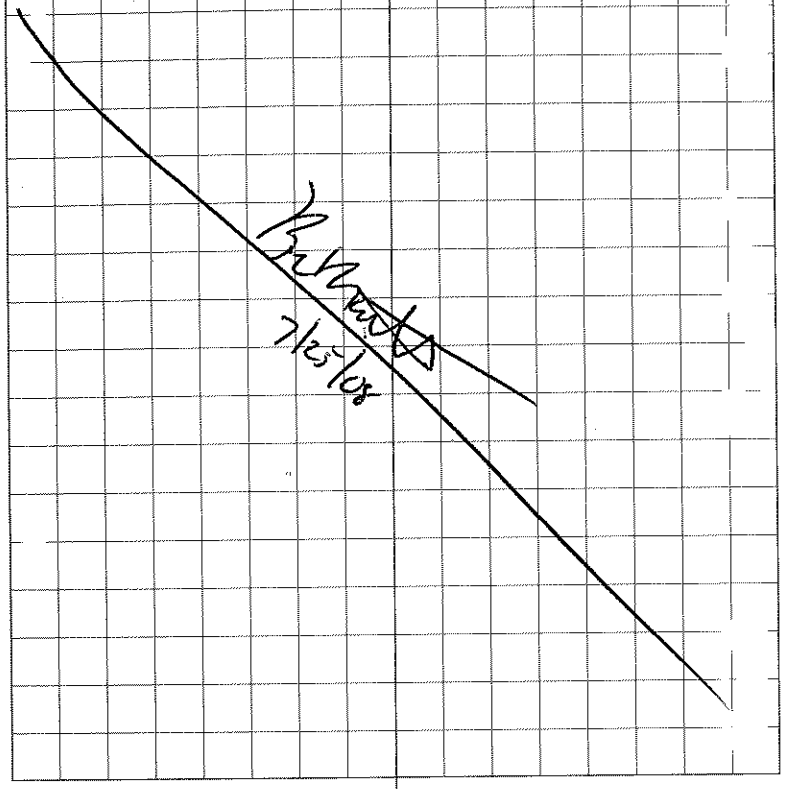
7/25/08

(13)

14-139 4th + Gambell 7/25/08

2215 BM confers site cleanup with GeoTek Scott Voyte. They will rake + seed near SB-5 tomorrow. BM departs site for office.

2245 BM puts samples in fridge + freezer. Will ship samples on Sunday to On Site. Sunday is 7/27. Depart office.



APPENDIX B

Photographs

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Photographs
4th and Gambell Site Characterization

Photograph 1. Drilling soil boring SB-1.

Photograph 2. Logging soil core.

Photographs
4th and Gambell Site Characterization

Photograph 3. Sampling MW-6.

Photograph 4. Drilling soil boring SB-4.

Photographs
4th and Gambell Site Characterization

Photograph 5. Color-Tec responses from soil boring SB-3.

Photograph 6. Drilling soil boring SB-1.

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APPENDIX C

Boring Logs

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BOREHOLE DESIGNATION: SB-1

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-25-2008
TOTAL BOREHOLE DEPTH: 39 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	0.0				1.0		**SP-GP** Sandy Gravel - Gravelly Sand;medium brown; moderately dense; well sorted: gravel clasts are subangular - angular and 2 inches in diameter; sand is medium - coarse grained.
NR	0.0	ND			2.0		
	0.0				3.0		
	0.0				4.0		Clasts subrounded to rounded from 4 to 12 feet bgs; dry
	0.0				5.0		
	0.0				6.0		
NR		ND	ND (20)	1440	7.0		
	0.0				8.0		
	0.0				9.0		
	0.0				10.0		
	0.0				11.0		
NR		ND			12.0		**SP** Sand with Gravel; medium brown; medium grained; moderately dense - moderately loose; dry
	0.0				13.0		
	0.0				14.0		
	0.0				15.0		

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

COMMENTS: NR - not recorded; ND - not detected (reporting limit in parentheses. as appropriate)

oasis ENVIRONMENTAL

BOREHOLE DESIGNATION: SB-1

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-25-2008
TOTAL BOREHOLE DEPTH: 39 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
NR	0.0	ND			16.0		
	0.0				17.0		
	0.0				18.0		
	0.0				19.0		**SP-GP** Gravelly Sand - Sandy Gravel; brown; moderately dense; dry; gravel clasts up to 1.5 inches in diameter; subrounded.
NR	0.0	ND			20.0		
	0.0				21.0		
	0.0				22.0		
	0.0				23.0		3-inch charcoal lens
	0.0				24.0		**SP-GP** Gravelly Sand to Sandy Gravel; brown; moderately dense to moderately loose; dry; clasts up to 1inch in diameter; subrounded
	0.0				25.0		**SP** Sand with Gravel; brown
	0.0				26.0		3-inch charcoal lens
NR	0.0	ND			27.0		**SP** Sand with Gravel; brown; moderately dense to moderately loos; sand is mediaum to coarse grained; dry
	0.0				28.0		
	0.0				29.0		**SP-GP** Gravelly Sand; brown.
	0.0				30.0		

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

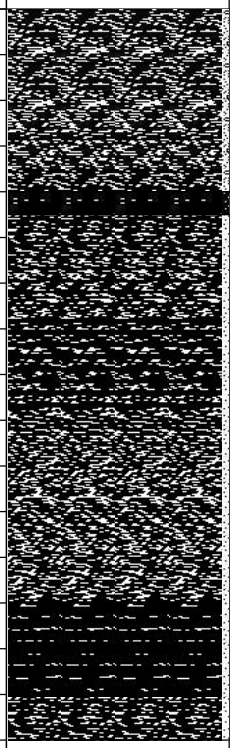
COMMENTS: NR - not recorded; ND - not detected (reporting limit in parentheses. as appropriate)

oasis ENVIRONMENTAL

BOREHOLE DESIGNATION: SB-1

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-25-2008
TOTAL BOREHOLE DEPTH: 39 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
NR	0.0	ND			31.0		
	0.0				32.0		3-inch charcoal lens
	0.0				33.0		**SP** Sand; brownish gray; medium-coarse grained; moderately loose; moist.
	0.0				34.0		
NR	0.0	ND	ND (31)	1435	35.0		
	0.0				36.0		
	0.0				37.0		
	0.0				38.0		Water table at 38 feet
	0.0				39.0		Total depth - 39 feet
					40.0		
					41.0		
					42.0		
					43.0		
					44.0		
					45.0		

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

COMMENTS: NR - not recorded; ND - not detected (reporting limit in parentheses. as appropriate)

oasis ENVIRONMENTAL

BOREHOLE DESIGNATION: SB-2

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-25-2008
TOTAL BOREHOLE DEPTH: 45 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	0.1				1.0		**Top Soil** Grasses with sandy silt
	0.0				2.0		**ML** Silt; light tan; moderately loose
NR	0.0	0.1			3.0		**SP-GP** Sandy Gravel - Gravelly Sand; dark brown.
	0.0				4.0		
	0.1				5.0		
	0.0				6.0		
	0.0				7.0		
NR	0.0	0.9			8.0		
	0.0				9.0		
	0.1				10.0		
	2.0				11.0		
	1.6				12.0		
NR	0.3	5.0			13.0		
	0.6				14.0		
	0.1				15.0		

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

COMMENTS: NR - not recorded;

oasis ENVIRONMENTAL

BOREHOLE DESIGNATION: SB-2

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-25-2008
TOTAL BOREHOLE DEPTH: 45 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	16.4				16.0		**SP-GP** Sandy Gravel - Gravelly Sand; dark brown.
	8.6				17.0		
NR		25					
	1.6				18.0		
	3.2				19.0		
	5				20.0		
							4-inch charcoal lens; black
	11.0				21.0		**SP-GP** Gravelly Sand - Sandy Gravel
	6.8				22.0		4-inch charcoal lens; black
NR		70	45,000	1955			**SP-GP** Gravelly Sand - Sandy Gravel; brown; moderately loose - moderatelhy dense; sand is medium to coarse grained; gravel is subrounded.
	6.0				23.0		
	7.2				24.0		
	1.2				25.0		
	4.8				26.0		
	9.5				27.0		
NR		18					
	6.3				28.0		
	11.5				29.0		
	8.4				30.0		

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

COMMENTS: NR - not recorded;

oasis ENVIRONMENTAL

BOREHOLE DESIGNATION: SB-2

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-25-2008
TOTAL BOREHOLE DEPTH: 45 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	8.6				31.0		**SP** Sand with occasional gravel; fine-coarse grained; dry.
	44				32.0		4-inch charcoal seam; black
NR	7.4	60			33.0		**SP** Sand; grayish brown; medium grained; moist.
	16				34.0		
	15				35.0		
	7.0				36.0		
	7.1				37.0		
NR		8					
	7.8		16,000	1950	38.0		
	19				39.0		
	2.8				40.0		
	10				41.0		Water table at 41.5 feet
					42.0		
					43.0		
					44.0		
					45.0		Total depth - 45 feet

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

COMMENTS: NR - not recorded;

oasis ENVIRONMENTAL

BOREHOLE DESIGNATION: SB-3

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-25-2008
TOTAL BOREHOLE DEPTH: 44 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	0.9				1.0		**ML** Silt with Gravel; dark brown; tight; subrounded gravel
NR	0.2	73			2.0		**SW** Gravelly Sand; light brown - brown; moderately loose; medium-coarse grained sand; subrounded gravel up to 1.5" diameter.
	0.1				3.0		
	0.1				4.0		
	0.3				5.0		
	0.1				6.0		
NR		1.7					
	0.1				7.0		
	0.7				8.0		
	0.5				9.0		**SP-GP** Gravelly Sand; brown; medium-coarse grained sand; subrounded-rounded gravel up to 1.5" diameter.
	1.2				10.0		
	4.3				11.0		
NR		5					
	1.2				12.0		
	2.4				13.0		
	7.8				14.0		
	3.3				15.0		

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

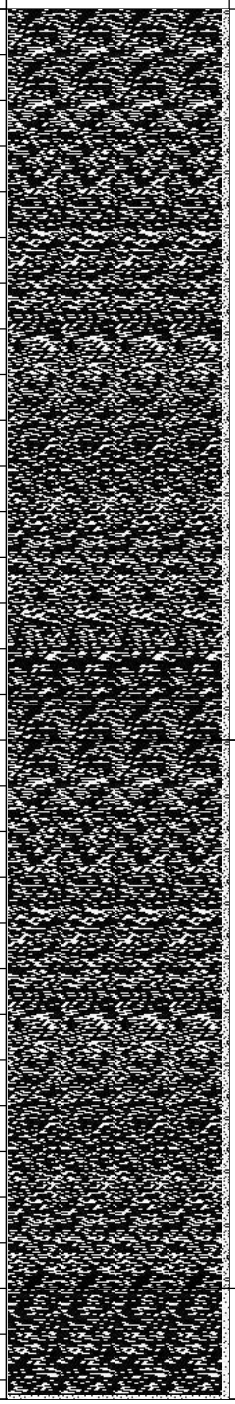
COMMENTS: NR - not recorded;

oasis ENVIRONMENTAL

BOREHOLE DESIGNATION: SB-3

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-25-2008
TOTAL BOREHOLE DEPTH: 44 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	2.2				16.0		2-3" lenses of black charcoal. Charcoal reads 17 ppm on PID and 50 ppm on Color-Tec
NR		7					
	1.6				17.0		
	0.7				18.0		
	0.6				19.0		
	11.2				20.0		
	3.3				21.0		
NR		18					
	17.5				22.0		
	4.7				23.0		**SP** Sand with Gravel; medium brown; moderately tight; fine-coarse grained sand with well rounded gravel up to 1" diameter; well sorted.
	1.8				24.0		
	13.2				25.0		
	3.5				26.0		
NR		30	54,000	1925			
	9.4				27.0		
	8.7				28.0		
	26.3				29.0		**SP** Sand; light brown; coarse grained sand with lenses of sand with gravel.
	7.3				30.0		

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

COMMENTS: NR - not recorded;

oasis ENVIRONMENTAL

BOREHOLE DESIGNATION: SB-3

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-25-2008
TOTAL BOREHOLE DEPTH: 44 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	11.8				31.0		
NR		19	9,900	1935			
	10.9				32.0		**SP** Sand; fine grained; poorly graded.
	7.8				33.0		**SP** Sand; medium-coarse grained
	6.1				34.0		
	4.0	4			35.0		
	43	6			36.0		**SP** Sand; brown; moderately loose; medium grained; poorly graded.
NR	6.6				37.0		
		4					
	7.1				38.0		
	3.3				39.0		
	6.8	9	4,000	1940	40.0		Moist
	2.8				41.0		Water table at 41 feet
NR					42.0		Saturated
					43.0		
					44.0		
					45.0		Total depth - 44 feet

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

COMMENTS: NR - not recorded;

oasis ENVIRONMENTAL

BOREHOLE DESIGNATION: SB-4

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-25-2008
TOTAL BOREHOLE DEPTH: 44 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	0.2				1.0		**SP-GP** Gravelly Sand; dark brown; moderately dense; poorly sorted; moist; medium grained sand; subrounded to well rounded gravel up to 1.5" diameter
NR	0.2	0.8			2.0		
	0.2				3.0		
	0.1				4.0		
	0.1				5.0		**ML** 4-inch lens of silt with gravel; tight; subangular gravel to 2" diameter. **ML** Gravelly Silt; dark brown; dry; moderately loose; subangular gravel up to 2" diameter
	0.1				6.0		
NR		0.7			7.0		
	0.2				8.0		
	0.1				9.0		
	0.1				10.0		
	0.1				11.0		
NR		4.0			12.0		
	0.3				13.0		
	0.5				14.0		
	0.5				15.0		
	0.4						

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

COMMENTS: NR - not recorded

oasis ENVIRONMENTAL

BOREHOLE DESIGNATION: SB-4

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-25-2008
TOTAL BOREHOLE DEPTH: 44 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	2.7				16.0		**SW** Sand with Gravel; brown; well sorted; mod. loose; medium-coarse grained
NR		2.0					
	1.2				17.0		**SP-GP** Gravelly Sand; brown; moderately dense; poorly graded; medium-coarse grained sand; subangular-angular gravel up to 2" diameter
	0.5				18.0		
	0.4				19.0		
	0.3				20.0		
	0.6				21.0		
NR		2.5					
	0.1				22.0		
	1.4				23.0		
	0.8				24.0		
	10.0				25.0		3- to 4-inch charcoal lens
	1.3				26.0		**SP-GP** Gravelly Sand; brown; moderately dense; poorly graded; medium-coarse grained sand; subangular-angular gravel up to 2" diameter
NR		12	9,300	1055			
	0.6				27.0		
	1.4				28.0		
	1.5				29.0		
	6.5				30.0		

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

COMMENTS: NR - not recorded

oasis ENVIRONMENTAL

BOREHOLE DESIGNATION: SB-4

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-25-2008
TOTAL BOREHOLE DEPTH: 44 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	3.6				31.0		2-inch charcoal lens
NR		12					**SP-GP** Gravelly Sand; brown; moderately dense; poorly graded; medium-coarse grained sand; subangular-angular gravel up to 2" diameter
	3.6				32.0		
	1.4				33.0		
	0.4				34.0		**SP** Sand; brown; moderately loose; well sorted; medium-coarse grained.
	3.5				35.0		
	2.4				36.0		
NR		1.0					
	1.1				37.0		
	4.7				38.0		
	0.8				39.0		
	3.3	1.7	2,900	1105	40.0		
	1.7				41.0		
NR							Water table at 41.5 feet
					42.0		
					43.0		
					44.0		
							Total depth - 44 feet
					45.0		

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

COMMENTS: NR - not recorded

oasis ENVIRONMENTAL

BOREHOLE DESIGNATION: SB-5

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-25-2008
TOTAL BOREHOLE DEPTH: 44 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	0.0				1.0		**Top Soil** Grasses with sandy silt **ML** Silt; tan; tight; dry
NR	0.0	ND			2.0		**SP-GP** Gravelly Sand - Sandy Gravel; light brown; moderately dense; subangular gravel up to 1.5" diameter.
	0.0				3.0		
	0.0				4.0		
	0.0				5.0		
NR	0.0	ND			6.0		
	0.0				7.0		
	0.0				8.0		
	0.0				9.0		
	0.0				10.0		2-inch charcoal lens; black **SP-GP** Gravelly Sand - Sandy Gravel; light brown; moderately dense; subangular gravel up to 1.5" diameter.
NR	0.0	ND			11.0		
	0.0				12.0		
	0.0				13.0		
	0.0				14.0		
	0.0				15.0		

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

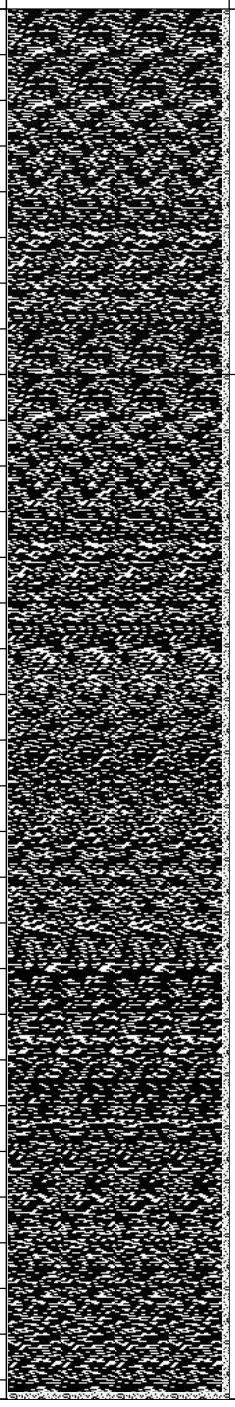
COMMENTS: NR - not recorded; ND - not detected

oasis ENVIRONMENTAL

BOREHOLE DESIGNATION: SB-5

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-25-2008
TOTAL BOREHOLE DEPTH: 44 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	0.0				16.0		**SP-GP** Gravelly Sand - Sandy Gravel; grayish brown; moist; medium to coarse grained sand.
NR		0.4					
	0.0				17.0		
	0.0				18.0		
	0.1				19.0		**SP-GP** Sand with Gravel; brown; damp; medium-coarse grained sand; gradeds to poorly graded sand near bottom.
	0.0				20.0		
	0.0				21.0		
NR		1.9	840	1740			
	0.0				22.0		
	0.0				23.0		
	0.1				24.0		
	0.0				25.0		
	0.3				26.0		
NR		1.7					
	0.0				27.0		
	0.0				28.0		
	1.4				29.0		
	0.0				30.0		

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

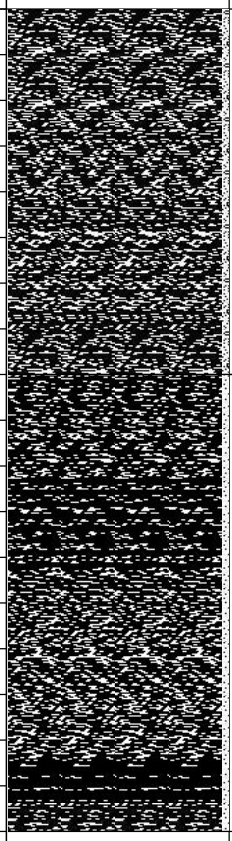
COMMENTS: NR - not recorded; ND - not detected

oasis ENVIRONMENTAL

BOREHOLE DESIGNATION: SB-5

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-25-2008
TOTAL BOREHOLE DEPTH: 44 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
NR	0.5 0.5 0.1 0.0	0.8			31.0 32.0 33.0 34.0		
NR	0.2 0.3 0.3 0.9 1.9	0.6	1,600	1830	35.0 36.0 37.0 38.0 39.0		**SP** Sand; grayish brown; moderately dense; moist.
NR					40.0 41.0 42.0 43.0 44.0 45.0		Drillers could not extract sample from 39 to 44 feet, but bottom sample was saturated Total depth - 44 feet

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

COMMENTS: NR - not recorded; ND - not detected

oasis ENVIRONMENTAL

BOREHOLE DESIGNATION: SB-6

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-24-2008
TOTAL BOREHOLE DEPTH: 35 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	0.2				1.0		**ML** Silt with Gravel; light brown; loose; poorly sorted.
NR	0.1 0.2 0.1	ND			2.0 3.0 4.0		**SP-GP** Gravelly Sand - Sandy Gravel; dense; poorly graded; subrounded to well rounded gravel up to 1.75" diameter.
	NM				5.0		
NR	0.1 0.1 0.1 0.1	ND			6.0 7.0 8.0 9.0		
	0.1				10.0		
NR	0.2 0.3 0.2	ND			11.0 12.0 13.0		**SP** Sand with gravel; medium brown; well sorted; coarse grained
	0.1 0.1				14.0 15.0		

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

COMMENTS: NR - not recorded; NM - not measured; ND - not detected

oasis ENVIRONMENTAL

BOREHOLE DESIGNATION: SB-6

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-24-2008
TOTAL BOREHOLE DEPTH: 35 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
							GP Gravelly Sand; medium brown; poorly sorted; moderately dense.
	0.2				16.0		**SP** Sand; brown; fine-medium grained.
	0.1				17.0		
NR		ND					
	0.1				18.0		
	0.1				19.0		
	0.1				20.0		
	0.2				21.0		
	0.2				22.0		
NR		ND					
	0.3				23.0		**GP-SP** Gravelly Sand - Sand Gravel; brown;
	0.3				24.0		
	0.1				25.0		
	0.3				26.0		
	0.2				27.0		
NR		ND					
	0.3				28.0		**SW** Sand with Gravel; brown; well graded
	0.2				29.0		
	0.1				30.0		

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

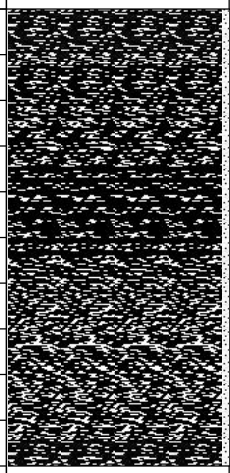
COMMENTS: NR - not recorded; NM - not measured; ND - not detected

oasis ENVIRONMENTAL

BOREHOLE DESIGNATION: SB-6

PROJECT NAME: 4TH AND GAMBELL SITE CHARACTERIZATION
LOCATION: ANCHORAGE
PROJECT MANAGER: BEN MARTICH
LOGGED BY: CRAIG SCOLA
PROJECT NUMBER: 14-139
DATUM ELEVATION:

START TIME / END TIME:
DATE COMPLETED: 7-24-2008
TOTAL BOREHOLE DEPTH: 35 FEET
DRILLING CONTRACTOR: GEOTEK ALASKA
DRILL RIG TYPE: DIRECT PUSH
SAMPLING METHOD: GEOPROBE

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	PCE (ug/kg)	TIME SAMPLED	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
NR	0.1 0.1 0.1 0.1 0.1	ND	 260	 1615	31.0 32.0 33.0 34.0 35.0 36.0 37.0 38.0 39.0 40.0 41.0 42.0 43.0 44.0 45.0		**SW** Sand; grayish brown; well sorted; medium-fine grained; occasional pea-sized, well rounded, gravel. Geoprobe refusal at 35 feet Total depth - 35 feet

DATE: 8-8-2008
DRAWN BY: LCN
CHECKED BY: BM
PROJECT NUMBER: 14-139

COMMENTS: NR - not recorded; NM - not measured; ND - not detected

oasis ENVIRONMENTAL

APPENDIX D

Laboratory Analytical Data Reports

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OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

August 11, 2008

Ben Martich
Oasis Environmental, Inc.
825 W 8th Avenue, Suite 200
Anchorage, AK 99501

Re: Analytical Data for Project 14-139
Laboratory Reference No. 0807-225

Dear Ben:

Enclosed are the analytical results and associated quality control data for samples submitted on July 28, 2008.

CS Laboratory Approval Number: UST-039

The standard policy of OnSite Environmental Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

Case Narrative

Samples were collected on July 24 and 25, 2008 and received by the laboratory on July 28, 2008. They were maintained at the laboratory at a temperature of 2°C to 6°C except as noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

GRO AK101 (water) Analysis

Alaska GRO results for samples 084AG101GW and 084AG102GW are attributed to a single peak (PCE).

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

GRO AK101 (soil) Analysis

Alaska GRO results for samples 084AG105SB, 084AG106SB, 084AG107SB, 084AG109SB, 084AG117SB, and 084AG118SB are attributed to a single peak (PCE).

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Analyst's Signature

_____ _____
Stacey Duran, Volatiles Chemist Date

Analyst's Signature

_____ _____
Arina Podnozova, GC Volatiles Chemist Date

Analyst's Signature

_____ _____
Dana Young, GC Semi-Volatiles Chemist Date

Analyst's Signature

_____ _____
William Kelsch, Inorganics Chemist Date

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
Page 1 of 2

Date Extracted: 7-24-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-03
Client ID: 084AG103SB

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.032
Chloromethane	ND		0.16
Vinyl Chloride	ND		0.032
Bromomethane	ND		0.032
Chloroethane	ND		0.16
Trichlorofluoromethane	ND		0.032
1,1-Dichloroethene	ND		0.032
Acetone	ND		0.16
Iodomethane	ND		0.16
Carbon Disulfide	ND		0.032
Methylene Chloride	ND		0.16
(trans) 1,2-Dichloroethene	ND		0.032
Methyl t-Butyl Ether	ND		0.032
1,1-Dichloroethane	ND		0.032
Vinyl Acetate	ND		0.16
2,2-Dichloropropane	ND		0.032
(cis) 1,2-Dichloroethene	ND		0.032
2-Butanone	ND		0.16
Bromochloromethane	ND		0.032
Chloroform	ND		0.032
1,1,1-Trichloroethane	ND		0.032
Carbon Tetrachloride	ND		0.032
1,1-Dichloropropene	ND		0.032
Benzene	ND		0.032
1,2-Dichloroethane	ND		0.032
Trichloroethene	ND		0.032
1,2-Dichloropropane	ND		0.032
Dibromomethane	ND		0.032
Bromodichloromethane	ND		0.032
2-Chloroethyl Vinyl Ether	ND		0.16
(cis) 1,3-Dichloropropene	ND		0.032
Methyl Isobutyl Ketone	ND		0.16
Toluene	ND		0.16
(trans) 1,3-Dichloropropene	ND		0.032

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
Page 2 of 2

Lab ID: 07-225-03
Client ID: 084AG103SB

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.032
Tetrachloroethene	0.26		0.032
1,3-Dichloropropane	ND		0.032
2-Hexanone	ND		0.16
Dibromochloromethane	ND		0.032
1,2-Dibromoethane	ND		0.032
Chlorobenzene	ND		0.032
1,1,1,2-Tetrachloroethane	ND		0.032
Ethylbenzene	ND		0.032
m,p-Xylene	ND		0.065
o-Xylene	ND		0.032
Styrene	ND		0.032
Bromoform	ND		0.032
Isopropylbenzene	ND		0.032
Bromobenzene	ND		0.032
1,1,2,2-Tetrachloroethane	ND		0.032
1,2,3-Trichloropropane	ND		0.032
n-Propylbenzene	ND		0.032
2-Chlorotoluene	ND		0.032
4-Chlorotoluene	ND		0.032
1,3,5-Trimethylbenzene	ND		0.032
tert-Butylbenzene	ND		0.032
1,2,4-Trimethylbenzene	ND		0.032
sec-Butylbenzene	ND		0.032
1,3-Dichlorobenzene	ND		0.032
p-Isopropyltoluene	ND		0.032
1,4-Dichlorobenzene	ND		0.032
1,2-Dichlorobenzene	ND		0.032
n-Butylbenzene	ND		0.032
1,2-Dibromo-3-chloropropane	ND		0.16
1,2,4-Trichlorobenzene	ND		0.032
Hexachlorobutadiene	ND		0.16
Naphthalene	ND		0.032
1,2,3-Trichlorobenzene	ND		0.032

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	104	70-118
Toluene-d8	104	70-121
4-Bromofluorobenzene	107	70-130

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
Page 1 of 2

Date Extracted: 7-24-08
Date Analyzed: 8-1&4-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-05
Client ID: 084AG105SB

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.020
Chloromethane	ND		0.10
Vinyl Chloride	ND		0.020
Bromomethane	ND		0.020
Chloroethane	ND		0.10
Trichlorofluoromethane	ND		0.020
1,1-Dichloroethene	ND		0.020
Acetone	ND		0.10
Iodomethane	ND		0.10
Carbon Disulfide	ND		0.020
Methylene Chloride	ND		0.10
(trans) 1,2-Dichloroethene	ND		0.020
Methyl t-Butyl Ether	ND		0.020
1,1-Dichloroethane	ND		0.020
Vinyl Acetate	ND		0.10
2,2-Dichloropropane	ND		0.020
(cis) 1,2-Dichloroethene	ND		0.020
2-Butanone	ND		0.10
Bromochloromethane	ND		0.020
Chloroform	ND		0.020
1,1,1-Trichloroethane	ND		0.020
Carbon Tetrachloride	ND		0.020
1,1-Dichloropropene	ND		0.020
Benzene	ND		0.020
1,2-Dichloroethane	ND		0.020
Trichloroethene	ND		0.020
1,2-Dichloropropane	ND		0.020
Dibromomethane	ND		0.020
Bromodichloromethane	ND		0.020
2-Chloroethyl Vinyl Ether	ND		0.10
(cis) 1,3-Dichloropropene	ND		0.020
Methyl Isobutyl Ketone	ND		0.10
Toluene	ND		0.10
(trans) 1,3-Dichloropropene	ND		0.020

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
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Lab ID: 07-225-05
Client ID: 084AG105SB

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.020
Tetrachloroethene	54		0.41
1,3-Dichloropropane	ND		0.020
2-Hexanone	ND		0.10
Dibromochloromethane	ND		0.020
1,2-Dibromoethane	ND		0.020
Chlorobenzene	ND		0.020
1,1,1,2-Tetrachloroethane	ND		0.020
Ethylbenzene	ND		0.020
m,p-Xylene	ND		0.041
o-Xylene	ND		0.020
Styrene	ND		0.020
Bromoform	ND		0.020
Isopropylbenzene	ND		0.020
Bromobenzene	ND		0.020
1,1,2,2-Tetrachloroethane	ND		0.020
1,2,3-Trichloropropane	ND		0.020
n-Propylbenzene	ND		0.020
2-Chlorotoluene	ND		0.020
4-Chlorotoluene	ND		0.020
1,3,5-Trimethylbenzene	ND		0.020
tert-Butylbenzene	ND		0.020
1,2,4-Trimethylbenzene	ND		0.020
sec-Butylbenzene	ND		0.020
1,3-Dichlorobenzene	ND		0.020
p-Isopropyltoluene	ND		0.020
1,4-Dichlorobenzene	ND		0.020
1,2-Dichlorobenzene	ND		0.020
n-Butylbenzene	ND		0.020
1,2-Dibromo-3-chloropropane	ND		0.10
1,2,4-Trichlorobenzene	ND		0.020
Hexachlorobutadiene	ND		0.10
Naphthalene	ND		0.020
1,2,3-Trichlorobenzene	ND		0.020

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	97	70-118
Toluene-d8	95	70-121
4-Bromofluorobenzene	100	70-130

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
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Date Extracted: 7-24-08
Date Analyzed: 8-1&4-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-06
Client ID: 084AG106SB

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.023
Chloromethane	ND		0.11
Vinyl Chloride	ND		0.023
Bromomethane	ND		0.023
Chloroethane	ND		0.11
Trichlorofluoromethane	ND		0.023
1,1-Dichloroethene	ND		0.023
Acetone	ND		0.11
Iodomethane	ND		0.11
Carbon Disulfide	ND		0.023
Methylene Chloride	ND		0.11
(trans) 1,2-Dichloroethene	ND		0.023
Methyl t-Butyl Ether	ND		0.023
1,1-Dichloroethane	ND		0.023
Vinyl Acetate	ND		0.11
2,2-Dichloropropane	ND		0.023
(cis) 1,2-Dichloroethene	ND		0.023
2-Butanone	ND		0.11
Bromochloromethane	ND		0.023
Chloroform	ND		0.023
1,1,1-Trichloroethane	ND		0.023
Carbon Tetrachloride	ND		0.023
1,1-Dichloropropene	ND		0.023
Benzene	ND		0.023
1,2-Dichloroethane	ND		0.023
Trichloroethene	ND		0.023
1,2-Dichloropropane	ND		0.023
Dibromomethane	ND		0.023
Bromodichloromethane	ND		0.023
2-Chloroethyl Vinyl Ether	ND		0.11
(cis) 1,3-Dichloropropene	ND		0.023
Methyl Isobutyl Ketone	ND		0.11
Toluene	ND		0.11
(trans) 1,3-Dichloropropene	ND		0.023

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
Page 2 of 2

Lab ID: 07-225-06
Client ID: 084AG106SB

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.023
Tetrachloroethene	20		0.45
1,3-Dichloropropane	ND		0.023
2-Hexanone	ND		0.11
Dibromochloromethane	ND		0.023
1,2-Dibromoethane	ND		0.023
Chlorobenzene	ND		0.023
1,1,1,2-Tetrachloroethane	ND		0.023
Ethylbenzene	ND		0.023
m,p-Xylene	ND		0.045
o-Xylene	ND		0.023
Styrene	ND		0.023
Bromoform	ND		0.023
Isopropylbenzene	ND		0.023
Bromobenzene	ND		0.023
1,1,2,2-Tetrachloroethane	ND		0.023
1,2,3-Trichloropropane	ND		0.023
n-Propylbenzene	ND		0.023
2-Chlorotoluene	ND		0.023
4-Chlorotoluene	ND		0.023
1,3,5-Trimethylbenzene	ND		0.023
tert-Butylbenzene	ND		0.023
1,2,4-Trimethylbenzene	ND		0.023
sec-Butylbenzene	ND		0.023
1,3-Dichlorobenzene	ND		0.023
p-Isopropyltoluene	ND		0.023
1,4-Dichlorobenzene	ND		0.023
1,2-Dichlorobenzene	ND		0.023
n-Butylbenzene	ND		0.023
1,2-Dibromo-3-chloropropane	ND		0.11
1,2,4-Trichlorobenzene	ND		0.023
Hexachlorobutadiene	ND		0.11
Naphthalene	ND		0.023
1,2,3-Trichlorobenzene	ND		0.023

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	106	70-118
Toluene-d8	103	70-121
4-Bromofluorobenzene	97	70-130

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
Page 1 of 2

Date Extracted: 7-24-08
Date Analyzed: 8-1&4-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-07
Client ID: 084AG107SB

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.025
Chloromethane	ND		0.13
Vinyl Chloride	ND		0.025
Bromomethane	ND		0.025
Chloroethane	ND		0.13
Trichlorofluoromethane	ND		0.025
1,1-Dichloroethene	ND		0.025
Acetone	ND		0.13
Iodomethane	ND		0.13
Carbon Disulfide	ND		0.025
Methylene Chloride	ND		0.13
(trans) 1,2-Dichloroethene	ND		0.025
Methyl t-Butyl Ether	ND		0.025
1,1-Dichloroethane	ND		0.025
Vinyl Acetate	ND		0.13
2,2-Dichloropropane	ND		0.025
(cis) 1,2-Dichloroethene	ND		0.025
2-Butanone	ND		0.13
Bromochloromethane	ND		0.025
Chloroform	ND		0.025
1,1,1-Trichloroethane	ND		0.025
Carbon Tetrachloride	ND		0.025
1,1-Dichloropropene	ND		0.025
Benzene	ND		0.025
1,2-Dichloroethane	ND		0.025
Trichloroethene	ND		0.025
1,2-Dichloropropane	ND		0.025
Dibromomethane	ND		0.025
Bromodichloromethane	ND		0.025
2-Chloroethyl Vinyl Ether	ND		0.13
(cis) 1,3-Dichloropropene	ND		0.025
Methyl Isobutyl Ketone	ND		0.13
Toluene	ND		0.13
(trans) 1,3-Dichloropropene	ND		0.025

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
Page 2 of 2

Lab ID: 07-225-07
Client ID: 084AG107SB

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.025
Tetrachloroethene	9.9		0.51
1,3-Dichloropropane	ND		0.025
2-Hexanone	ND		0.13
Dibromochloromethane	ND		0.025
1,2-Dibromoethane	ND		0.025
Chlorobenzene	ND		0.025
1,1,1,2-Tetrachloroethane	ND		0.025
Ethylbenzene	ND		0.025
m,p-Xylene	ND		0.051
o-Xylene	ND		0.025
Styrene	ND		0.025
Bromoform	ND		0.025
Isopropylbenzene	ND		0.025
Bromobenzene	ND		0.025
1,1,2,2-Tetrachloroethane	ND		0.025
1,2,3-Trichloropropane	ND		0.025
n-Propylbenzene	ND		0.025
2-Chlorotoluene	ND		0.025
4-Chlorotoluene	ND		0.025
1,3,5-Trimethylbenzene	ND		0.025
tert-Butylbenzene	ND		0.025
1,2,4-Trimethylbenzene	ND		0.025
sec-Butylbenzene	ND		0.025
1,3-Dichlorobenzene	ND		0.025
p-Isopropyltoluene	ND		0.025
1,4-Dichlorobenzene	ND		0.025
1,2-Dichlorobenzene	ND		0.025
n-Butylbenzene	ND		0.025
1,2-Dibromo-3-chloropropane	ND		0.13
1,2,4-Trichlorobenzene	ND		0.025
Hexachlorobutadiene	ND		0.13
Naphthalene	ND		0.025
1,2,3-Trichlorobenzene	ND		0.025

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	97	70-118
Toluene-d8	96	70-121
4-Bromofluorobenzene	105	70-130

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

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Date Extracted: 7-24-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-08
Client ID: 084AG108SB

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.020
Chloromethane	ND		0.10
Vinyl Chloride	ND		0.020
Bromomethane	ND		0.020
Chloroethane	ND		0.10
Trichlorofluoromethane	ND		0.020
1,1-Dichloroethene	ND		0.020
Acetone	ND		0.10
Iodomethane	ND		0.10
Carbon Disulfide	ND		0.020
Methylene Chloride	ND		0.10
(trans) 1,2-Dichloroethene	ND		0.020
Methyl t-Butyl Ether	ND		0.020
1,1-Dichloroethane	ND		0.020
Vinyl Acetate	ND		0.10
2,2-Dichloropropane	ND		0.020
(cis) 1,2-Dichloroethene	ND		0.020
2-Butanone	ND		0.10
Bromochloromethane	ND		0.020
Chloroform	ND		0.020
1,1,1-Trichloroethane	ND		0.020
Carbon Tetrachloride	ND		0.020
1,1-Dichloropropene	ND		0.020
Benzene	ND		0.020
1,2-Dichloroethane	ND		0.020
Trichloroethene	ND		0.020
1,2-Dichloropropane	ND		0.020
Dibromomethane	ND		0.020
Bromodichloromethane	ND		0.020
2-Chloroethyl Vinyl Ether	ND		0.10
(cis) 1,3-Dichloropropene	ND		0.020
Methyl Isobutyl Ketone	ND		0.10
Toluene	ND		0.10
(trans) 1,3-Dichloropropene	ND		0.020

This report pertains to the samples analyzed in accordance with the chain of custody,
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Lab ID: 07-225-08
Client ID: 084AG108SB

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.020
Tetrachloroethene	4.0		0.020
1,3-Dichloropropane	ND		0.020
2-Hexanone	ND		0.10
Dibromochloromethane	ND		0.020
1,2-Dibromoethane	ND		0.020
Chlorobenzene	ND		0.020
1,1,1,2-Tetrachloroethane	ND		0.020
Ethylbenzene	ND		0.020
m,p-Xylene	ND		0.040
o-Xylene	ND		0.020
Styrene	ND		0.020
Bromoform	ND		0.020
Isopropylbenzene	ND		0.020
Bromobenzene	ND		0.020
1,1,2,2-Tetrachloroethane	ND		0.020
1,2,3-Trichloropropane	ND		0.020
n-Propylbenzene	ND		0.020
2-Chlorotoluene	ND		0.020
4-Chlorotoluene	ND		0.020
1,3,5-Trimethylbenzene	ND		0.020
tert-Butylbenzene	ND		0.020
1,2,4-Trimethylbenzene	ND		0.020
sec-Butylbenzene	ND		0.020
1,3-Dichlorobenzene	ND		0.020
p-Isopropyltoluene	ND		0.020
1,4-Dichlorobenzene	ND		0.020
1,2-Dichlorobenzene	ND		0.020
n-Butylbenzene	ND		0.020
1,2-Dibromo-3-chloropropane	ND		0.10
1,2,4-Trichlorobenzene	ND		0.020
Hexachlorobutadiene	ND		0.10
Naphthalene	ND		0.020
1,2,3-Trichlorobenzene	ND		0.020

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	99	70-118
Toluene-d8	96	70-121
4-Bromofluorobenzene	96	70-130

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Date Extracted: 7-25-08
Date Analyzed: 8-1&4-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-09
Client ID: 084AG109SB

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.021
Chloromethane	ND		0.11
Vinyl Chloride	ND		0.021
Bromomethane	ND		0.021
Chloroethane	ND		0.11
Trichlorofluoromethane	ND		0.021
1,1-Dichloroethene	ND		0.021
Acetone	ND		0.11
Iodomethane	ND		0.11
Carbon Disulfide	ND		0.021
Methylene Chloride	ND		0.11
(trans) 1,2-Dichloroethene	ND		0.021
Methyl t-Butyl Ether	ND		0.021
1,1-Dichloroethane	ND		0.021
Vinyl Acetate	ND		0.11
2,2-Dichloropropane	ND		0.021
(cis) 1,2-Dichloroethene	ND		0.021
2-Butanone	ND		0.11
Bromochloromethane	ND		0.021
Chloroform	ND		0.021
1,1,1-Trichloroethane	ND		0.021
Carbon Tetrachloride	ND		0.021
1,1-Dichloropropene	ND		0.021
Benzene	ND		0.021
1,2-Dichloroethane	ND		0.021
Trichloroethene	ND		0.021
1,2-Dichloropropane	ND		0.021
Dibromomethane	ND		0.021
Bromodichloromethane	ND		0.021
2-Chloroethyl Vinyl Ether	ND		0.11
(cis) 1,3-Dichloropropene	ND		0.021
Methyl Isobutyl Ketone	ND		0.11
Toluene	ND		0.11
(trans) 1,3-Dichloropropene	ND		0.021

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Lab ID: 07-225-09
Client ID: 084AG109SB

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.021
Tetrachloroethene	9.3		0.42
1,3-Dichloropropane	ND		0.021
2-Hexanone	ND		0.11
Dibromochloromethane	ND		0.021
1,2-Dibromoethane	ND		0.021
Chlorobenzene	ND		0.021
1,1,1,2-Tetrachloroethane	ND		0.021
Ethylbenzene	ND		0.021
m,p-Xylene	ND		0.042
o-Xylene	ND		0.021
Styrene	ND		0.021
Bromoform	ND		0.021
Isopropylbenzene	ND		0.021
Bromobenzene	ND		0.021
1,1,2,2-Tetrachloroethane	ND		0.021
1,2,3-Trichloropropane	ND		0.021
n-Propylbenzene	ND		0.021
2-Chlorotoluene	ND		0.021
4-Chlorotoluene	ND		0.021
1,3,5-Trimethylbenzene	ND		0.021
tert-Butylbenzene	ND		0.021
1,2,4-Trimethylbenzene	ND		0.021
sec-Butylbenzene	ND		0.021
1,3-Dichlorobenzene	ND		0.021
p-Isopropyltoluene	ND		0.021
1,4-Dichlorobenzene	ND		0.021
1,2-Dichlorobenzene	ND		0.021
n-Butylbenzene	ND		0.021
1,2-Dibromo-3-chloropropane	ND		0.11
1,2,4-Trichlorobenzene	ND		0.021
Hexachlorobutadiene	ND		0.11
Naphthalene	ND		0.021
1,2,3-Trichlorobenzene	ND		0.021

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	98	70-118
Toluene-d8	98	70-121
4-Bromofluorobenzene	102	70-130

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Date Extracted: 7-25-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-10
Client ID: 084AG110SB

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.027
Chloromethane	ND		0.14
Vinyl Chloride	ND		0.027
Bromomethane	ND		0.027
Chloroethane	ND		0.14
Trichlorofluoromethane	ND		0.027
1,1-Dichloroethene	ND		0.027
Acetone	ND		0.14
Iodomethane	ND		0.14
Carbon Disulfide	ND		0.027
Methylene Chloride	ND		0.14
(trans) 1,2-Dichloroethene	ND		0.027
Methyl t-Butyl Ether	ND		0.027
1,1-Dichloroethane	ND		0.027
Vinyl Acetate	ND		0.14
2,2-Dichloropropane	ND		0.027
(cis) 1,2-Dichloroethene	ND		0.027
2-Butanone	ND		0.14
Bromochloromethane	ND		0.027
Chloroform	ND		0.027
1,1,1-Trichloroethane	ND		0.027
Carbon Tetrachloride	ND		0.027
1,1-Dichloropropene	ND		0.027
Benzene	ND		0.027
1,2-Dichloroethane	ND		0.027
Trichloroethene	ND		0.027
1,2-Dichloropropane	ND		0.027
Dibromomethane	ND		0.027
Bromodichloromethane	ND		0.027
2-Chloroethyl Vinyl Ether	ND		0.14
(cis) 1,3-Dichloropropene	ND		0.027
Methyl Isobutyl Ketone	ND		0.14
Toluene	ND		0.14
(trans) 1,3-Dichloropropene	ND		0.027

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Lab ID: 07-225-10
Client ID: 084AG110SB

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.027
Tetrachloroethene	2.9		0.027
1,3-Dichloropropane	ND		0.027
2-Hexanone	ND		0.14
Dibromochloromethane	ND		0.027
1,2-Dibromoethane	ND		0.027
Chlorobenzene	ND		0.027
1,1,1,2-Tetrachloroethane	ND		0.027
Ethylbenzene	ND		0.027
m,p-Xylene	ND		0.054
o-Xylene	ND		0.027
Styrene	ND		0.027
Bromoform	ND		0.027
Isopropylbenzene	ND		0.027
Bromobenzene	ND		0.027
1,1,2,2-Tetrachloroethane	ND		0.027
1,2,3-Trichloropropane	ND		0.027
n-Propylbenzene	ND		0.027
2-Chlorotoluene	ND		0.027
4-Chlorotoluene	ND		0.027
1,3,5-Trimethylbenzene	ND		0.027
tert-Butylbenzene	ND		0.027
1,2,4-Trimethylbenzene	ND		0.027
sec-Butylbenzene	ND		0.027
1,3-Dichlorobenzene	ND		0.027
p-Isopropyltoluene	ND		0.027
1,4-Dichlorobenzene	ND		0.027
1,2-Dichlorobenzene	ND		0.027
n-Butylbenzene	ND		0.027
1,2-Dibromo-3-chloropropane	ND		0.14
1,2,4-Trichlorobenzene	ND		0.027
Hexachlorobutadiene	ND		0.14
Naphthalene	ND		0.027
1,2,3-Trichlorobenzene	ND		0.027

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	101	70-118
Toluene-d8	105	70-121
4-Bromofluorobenzene	102	70-130

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date Extracted: 7-25-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-11
Client ID: 084AG111SB

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.031
Chloromethane	ND		0.16
Vinyl Chloride	ND		0.031
Bromomethane	ND		0.031
Chloroethane	ND		0.16
Trichlorofluoromethane	ND		0.031
1,1-Dichloroethene	ND		0.031
Acetone	ND		0.16
Iodomethane	ND		0.16
Carbon Disulfide	ND		0.031
Methylene Chloride	ND		0.16
(trans) 1,2-Dichloroethene	ND		0.031
Methyl t-Butyl Ether	ND		0.031
1,1-Dichloroethane	ND		0.031
Vinyl Acetate	ND		0.16
2,2-Dichloropropane	ND		0.031
(cis) 1,2-Dichloroethene	ND		0.031
2-Butanone	ND		0.16
Bromochloromethane	ND		0.031
Chloroform	ND		0.031
1,1,1-Trichloroethane	ND		0.031
Carbon Tetrachloride	ND		0.031
1,1-Dichloropropene	ND		0.031
Benzene	ND		0.031
1,2-Dichloroethane	ND		0.031
Trichloroethene	ND		0.031
1,2-Dichloropropane	ND		0.031
Dibromomethane	ND		0.031
Bromodichloromethane	ND		0.031
2-Chloroethyl Vinyl Ether	ND		0.16
(cis) 1,3-Dichloropropene	ND		0.031
Methyl Isobutyl Ketone	ND		0.16
Toluene	ND		0.16
(trans) 1,3-Dichloropropene	ND		0.031

This report pertains to the samples analyzed in accordance with the chain of custody,
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Lab ID: 07-225-11
Client ID: 084AG111SB

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.031
Tetrachloroethene	ND		0.031
1,3-Dichloropropane	ND		0.031
2-Hexanone	ND		0.16
Dibromochloromethane	ND		0.031
1,2-Dibromoethane	ND		0.031
Chlorobenzene	ND		0.031
1,1,1,2-Tetrachloroethane	ND		0.031
Ethylbenzene	ND		0.031
m,p-Xylene	ND		0.062
o-Xylene	ND		0.031
Styrene	ND		0.031
Bromoform	ND		0.031
Isopropylbenzene	ND		0.031
Bromobenzene	ND		0.031
1,1,2,2-Tetrachloroethane	ND		0.031
1,2,3-Trichloropropane	ND		0.031
n-Propylbenzene	ND		0.031
2-Chlorotoluene	ND		0.031
4-Chlorotoluene	ND		0.031
1,3,5-Trimethylbenzene	ND		0.031
tert-Butylbenzene	ND		0.031
1,2,4-Trimethylbenzene	ND		0.031
sec-Butylbenzene	ND		0.031
1,3-Dichlorobenzene	ND		0.031
p-Isopropyltoluene	ND		0.031
1,4-Dichlorobenzene	ND		0.031
1,2-Dichlorobenzene	ND		0.031
n-Butylbenzene	ND		0.031
1,2-Dibromo-3-chloropropane	ND		0.16
1,2,4-Trichlorobenzene	ND		0.031
Hexachlorobutadiene	ND		0.16
Naphthalene	ND		0.031
1,2,3-Trichlorobenzene	ND		0.031

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	93	70-118
Toluene-d8	94	70-121
4-Bromofluorobenzene	101	70-130

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date Extracted: 7-25-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-12
Client ID: 084AG112SB

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.020
Chloromethane	ND		0.10
Vinyl Chloride	ND		0.020
Bromomethane	ND		0.020
Chloroethane	ND		0.10
Trichlorofluoromethane	ND		0.020
1,1-Dichloroethene	ND		0.020
Acetone	ND		0.10
Iodomethane	ND		0.10
Carbon Disulfide	ND		0.020
Methylene Chloride	ND		0.10
(trans) 1,2-Dichloroethene	ND		0.020
Methyl t-Butyl Ether	ND		0.020
1,1-Dichloroethane	ND		0.020
Vinyl Acetate	ND		0.10
2,2-Dichloropropane	ND		0.020
(cis) 1,2-Dichloroethene	ND		0.020
2-Butanone	ND		0.10
Bromochloromethane	ND		0.020
Chloroform	ND		0.020
1,1,1-Trichloroethane	ND		0.020
Carbon Tetrachloride	ND		0.020
1,1-Dichloropropene	ND		0.020
Benzene	ND		0.020
1,2-Dichloroethane	ND		0.020
Trichloroethene	ND		0.020
1,2-Dichloropropane	ND		0.020
Dibromomethane	ND		0.020
Bromodichloromethane	ND		0.020
2-Chloroethyl Vinyl Ether	ND		0.10
(cis) 1,3-Dichloropropene	ND		0.020
Methyl Isobutyl Ketone	ND		0.10
Toluene	ND		0.10
(trans) 1,3-Dichloropropene	ND		0.020

This report pertains to the samples analyzed in accordance with the chain of custody,
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Lab ID: 07-225-12
Client ID: 084AG112SB

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.020
Tetrachloroethene	ND		0.020
1,3-Dichloropropane	ND		0.020
2-Hexanone	ND		0.10
Dibromochloromethane	ND		0.020
1,2-Dibromoethane	ND		0.020
Chlorobenzene	ND		0.020
1,1,1,2-Tetrachloroethane	ND		0.020
Ethylbenzene	ND		0.020
m,p-Xylene	ND		0.041
o-Xylene	ND		0.020
Styrene	ND		0.020
Bromoform	ND		0.020
Isopropylbenzene	ND		0.020
Bromobenzene	ND		0.020
1,1,2,2-Tetrachloroethane	ND		0.020
1,2,3-Trichloropropane	ND		0.020
n-Propylbenzene	ND		0.020
2-Chlorotoluene	ND		0.020
4-Chlorotoluene	ND		0.020
1,3,5-Trimethylbenzene	ND		0.020
tert-Butylbenzene	ND		0.020
1,2,4-Trimethylbenzene	ND		0.020
sec-Butylbenzene	ND		0.020
1,3-Dichlorobenzene	ND		0.020
p-Isopropyltoluene	ND		0.020
1,4-Dichlorobenzene	ND		0.020
1,2-Dichlorobenzene	ND		0.020
n-Butylbenzene	ND		0.020
1,2-Dibromo-3-chloropropane	ND		0.10
1,2,4-Trichlorobenzene	ND		0.020
Hexachlorobutadiene	ND		0.10
Naphthalene	ND		0.020
1,2,3-Trichlorobenzene	ND		0.020

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	108	70-118
Toluene-d8	109	70-121
4-Bromofluorobenzene	112	70-130

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date Extracted: 7-25-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-14
Client ID: 084AG114SB

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.023
Chloromethane	ND		0.12
Vinyl Chloride	ND		0.023
Bromomethane	ND		0.023
Chloroethane	ND		0.12
Trichlorofluoromethane	ND		0.023
1,1-Dichloroethene	ND		0.023
Acetone	ND		0.12
Iodomethane	ND		0.12
Carbon Disulfide	ND		0.023
Methylene Chloride	ND		0.12
(trans) 1,2-Dichloroethene	ND		0.023
Methyl t-Butyl Ether	ND		0.023
1,1-Dichloroethane	ND		0.023
Vinyl Acetate	ND		0.12
2,2-Dichloropropane	ND		0.023
(cis) 1,2-Dichloroethene	ND		0.023
2-Butanone	ND		0.12
Bromochloromethane	ND		0.023
Chloroform	ND		0.023
1,1,1-Trichloroethane	ND		0.023
Carbon Tetrachloride	ND		0.023
1,1-Dichloropropene	ND		0.023
Benzene	ND		0.023
1,2-Dichloroethane	ND		0.023
Trichloroethene	ND		0.023
1,2-Dichloropropane	ND		0.023
Dibromomethane	ND		0.023
Bromodichloromethane	ND		0.023
2-Chloroethyl Vinyl Ether	ND		0.12
(cis) 1,3-Dichloropropene	ND		0.023
Methyl Isobutyl Ketone	ND		0.12
Toluene	ND		0.12
(trans) 1,3-Dichloropropene	ND		0.023

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Lab ID: 07-225-14
Client ID: 084AG114SB

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.023
Tetrachloroethene	0.84		0.023
1,3-Dichloropropane	ND		0.023
2-Hexanone	ND		0.12
Dibromochloromethane	ND		0.023
1,2-Dibromoethane	ND		0.023
Chlorobenzene	ND		0.023
1,1,1,2-Tetrachloroethane	ND		0.023
Ethylbenzene	ND		0.023
m,p-Xylene	ND		0.047
o-Xylene	ND		0.023
Styrene	ND		0.023
Bromoform	ND		0.023
Isopropylbenzene	ND		0.023
Bromobenzene	ND		0.023
1,1,2,2-Tetrachloroethane	ND		0.023
1,2,3-Trichloropropane	ND		0.023
n-Propylbenzene	ND		0.023
2-Chlorotoluene	ND		0.023
4-Chlorotoluene	ND		0.023
1,3,5-Trimethylbenzene	ND		0.023
tert-Butylbenzene	ND		0.023
1,2,4-Trimethylbenzene	ND		0.023
sec-Butylbenzene	ND		0.023
1,3-Dichlorobenzene	ND		0.023
p-Isopropyltoluene	ND		0.023
1,4-Dichlorobenzene	ND		0.023
1,2-Dichlorobenzene	ND		0.023
n-Butylbenzene	ND		0.023
1,2-Dibromo-3-chloropropane	ND		0.12
1,2,4-Trichlorobenzene	ND		0.023
Hexachlorobutadiene	ND		0.12
Naphthalene	ND		0.023
1,2,3-Trichlorobenzene	ND		0.023

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	105	70-118
Toluene-d8	103	70-121
4-Bromofluorobenzene	102	70-130

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
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Date Extracted: 7-25-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-15
Client ID: 084AG115SB

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.023
Chloromethane	ND		0.12
Vinyl Chloride	ND		0.023
Bromomethane	ND		0.023
Chloroethane	ND		0.12
Trichlorofluoromethane	ND		0.023
1,1-Dichloroethene	ND		0.023
Acetone	ND		0.12
Iodomethane	ND		0.12
Carbon Disulfide	ND		0.023
Methylene Chloride	ND		0.12
(trans) 1,2-Dichloroethene	ND		0.023
Methyl t-Butyl Ether	ND		0.023
1,1-Dichloroethane	ND		0.023
Vinyl Acetate	ND		0.12
2,2-Dichloropropane	ND		0.023
(cis) 1,2-Dichloroethene	ND		0.023
2-Butanone	ND		0.12
Bromochloromethane	ND		0.023
Chloroform	ND		0.023
1,1,1-Trichloroethane	ND		0.023
Carbon Tetrachloride	ND		0.023
1,1-Dichloropropene	ND		0.023
Benzene	ND		0.023
1,2-Dichloroethane	ND		0.023
Trichloroethene	ND		0.023
1,2-Dichloropropane	ND		0.023
Dibromomethane	ND		0.023
Bromodichloromethane	ND		0.023
2-Chloroethyl Vinyl Ether	ND		0.12
(cis) 1,3-Dichloropropene	ND		0.023
Methyl Isobutyl Ketone	ND		0.12
Toluene	ND		0.12
(trans) 1,3-Dichloropropene	ND		0.023

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

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Lab ID: 07-225-15
Client ID: 084AG115SB

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.023
Tetrachloroethene	1.0		0.023
1,3-Dichloropropane	ND		0.023
2-Hexanone	ND		0.12
Dibromochloromethane	ND		0.023
1,2-Dibromoethane	ND		0.023
Chlorobenzene	ND		0.023
1,1,1,2-Tetrachloroethane	ND		0.023
Ethylbenzene	ND		0.023
m,p-Xylene	ND		0.046
o-Xylene	ND		0.023
Styrene	ND		0.023
Bromoform	ND		0.023
Isopropylbenzene	ND		0.023
Bromobenzene	ND		0.023
1,1,2,2-Tetrachloroethane	ND		0.023
1,2,3-Trichloropropane	ND		0.023
n-Propylbenzene	ND		0.023
2-Chlorotoluene	ND		0.023
4-Chlorotoluene	ND		0.023
1,3,5-Trimethylbenzene	ND		0.023
tert-Butylbenzene	ND		0.023
1,2,4-Trimethylbenzene	ND		0.023
sec-Butylbenzene	ND		0.023
1,3-Dichlorobenzene	ND		0.023
p-Isopropyltoluene	ND		0.023
1,4-Dichlorobenzene	ND		0.023
1,2-Dichlorobenzene	ND		0.023
n-Butylbenzene	ND		0.023
1,2-Dibromo-3-chloropropane	ND		0.12
1,2,4-Trichlorobenzene	ND		0.023
Hexachlorobutadiene	ND		0.12
Naphthalene	ND		0.023
1,2,3-Trichlorobenzene	ND		0.023

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	96	70-118
Toluene-d8	94	70-121
4-Bromofluorobenzene	105	70-130

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
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Date Extracted: 7-25-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-16
Client ID: 084AG116SB

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.022
Chloromethane	ND		0.11
Vinyl Chloride	ND		0.022
Bromomethane	ND		0.022
Chloroethane	ND		0.11
Trichlorofluoromethane	ND		0.022
1,1-Dichloroethene	ND		0.022
Acetone	ND		0.11
Iodomethane	ND		0.11
Carbon Disulfide	ND		0.022
Methylene Chloride	ND		0.11
(trans) 1,2-Dichloroethene	ND		0.022
Methyl t-Butyl Ether	ND		0.022
1,1-Dichloroethane	ND		0.022
Vinyl Acetate	ND		0.11
2,2-Dichloropropane	ND		0.022
(cis) 1,2-Dichloroethene	ND		0.022
2-Butanone	ND		0.11
Bromochloromethane	ND		0.022
Chloroform	ND		0.022
1,1,1-Trichloroethane	ND		0.022
Carbon Tetrachloride	ND		0.022
1,1-Dichloropropene	ND		0.022
Benzene	ND		0.022
1,2-Dichloroethane	ND		0.022
Trichloroethene	ND		0.022
1,2-Dichloropropane	ND		0.022
Dibromomethane	ND		0.022
Bromodichloromethane	ND		0.022
2-Chloroethyl Vinyl Ether	ND		0.11
(cis) 1,3-Dichloropropene	ND		0.022
Methyl Isobutyl Ketone	ND		0.11
Toluene	ND		0.11
(trans) 1,3-Dichloropropene	ND		0.022

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
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Lab ID: 07-225-16
Client ID: 084AG116SB

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.022
Tetrachloroethene	1.6		0.022
1,3-Dichloropropane	ND		0.022
2-Hexanone	ND		0.11
Dibromochloromethane	ND		0.022
1,2-Dibromoethane	ND		0.022
Chlorobenzene	ND		0.022
1,1,1,2-Tetrachloroethane	ND		0.022
Ethylbenzene	ND		0.022
m,p-Xylene	ND		0.043
o-Xylene	ND		0.022
Styrene	ND		0.022
Bromoform	ND		0.022
Isopropylbenzene	ND		0.022
Bromobenzene	ND		0.022
1,1,2,2-Tetrachloroethane	ND		0.022
1,2,3-Trichloropropane	ND		0.022
n-Propylbenzene	ND		0.022
2-Chlorotoluene	ND		0.022
4-Chlorotoluene	ND		0.022
1,3,5-Trimethylbenzene	ND		0.022
tert-Butylbenzene	ND		0.022
1,2,4-Trimethylbenzene	ND		0.022
sec-Butylbenzene	ND		0.022
1,3-Dichlorobenzene	ND		0.022
p-Isopropyltoluene	ND		0.022
1,4-Dichlorobenzene	ND		0.022
1,2-Dichlorobenzene	ND		0.022
n-Butylbenzene	ND		0.022
1,2-Dibromo-3-chloropropane	ND		0.11
1,2,4-Trichlorobenzene	ND		0.022
Hexachlorobutadiene	ND		0.11
Naphthalene	ND		0.022
1,2,3-Trichlorobenzene	ND		0.022

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	102	70-118
Toluene-d8	104	70-121
4-Bromofluorobenzene	107	70-130

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
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Date Extracted: 7-25-08
Date Analyzed: 8-1&4-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-17
Client ID: 084AG117SB

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.023
Chloromethane	ND		0.12
Vinyl Chloride	ND		0.023
Bromomethane	ND		0.023
Chloroethane	ND		0.12
Trichlorofluoromethane	ND		0.023
1,1-Dichloroethene	ND		0.023
Acetone	ND		0.12
Iodomethane	ND		0.12
Carbon Disulfide	ND		0.023
Methylene Chloride	ND		0.12
(trans) 1,2-Dichloroethene	ND		0.023
Methyl t-Butyl Ether	ND		0.023
1,1-Dichloroethane	ND		0.023
Vinyl Acetate	ND		0.12
2,2-Dichloropropane	ND		0.023
(cis) 1,2-Dichloroethene	ND		0.023
2-Butanone	ND		0.12
Bromochloromethane	ND		0.023
Chloroform	ND		0.023
1,1,1-Trichloroethane	ND		0.023
Carbon Tetrachloride	ND		0.023
1,1-Dichloropropene	ND		0.023
Benzene	ND		0.023
1,2-Dichloroethane	ND		0.023
Trichloroethene	ND		0.023
1,2-Dichloropropane	ND		0.023
Dibromomethane	ND		0.023
Bromodichloromethane	ND		0.023
2-Chloroethyl Vinyl Ether	ND		0.12
(cis) 1,3-Dichloropropene	ND		0.023
Methyl Isobutyl Ketone	ND		0.12
Toluene	ND		0.12
(trans) 1,3-Dichloropropene	ND		0.023

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
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Lab ID: 07-225-17
Client ID: 084AG117SB

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.023
Tetrachloroethene	16		0.47
1,3-Dichloropropane	ND		0.023
2-Hexanone	ND		0.12
Dibromochloromethane	ND		0.023
1,2-Dibromoethane	ND		0.023
Chlorobenzene	ND		0.023
1,1,1,2-Tetrachloroethane	ND		0.023
Ethylbenzene	ND		0.023
m,p-Xylene	ND		0.047
o-Xylene	ND		0.023
Styrene	ND		0.023
Bromoform	ND		0.023
Isopropylbenzene	ND		0.023
Bromobenzene	ND		0.023
1,1,2,2-Tetrachloroethane	ND		0.023
1,2,3-Trichloropropane	ND		0.023
n-Propylbenzene	ND		0.023
2-Chlorotoluene	ND		0.023
4-Chlorotoluene	ND		0.023
1,3,5-Trimethylbenzene	0.077		0.023
tert-Butylbenzene	ND		0.023
1,2,4-Trimethylbenzene	0.14		0.023
sec-Butylbenzene	ND		0.023
1,3-Dichlorobenzene	ND		0.023
p-Isopropyltoluene	ND		0.023
1,4-Dichlorobenzene	ND		0.023
1,2-Dichlorobenzene	ND		0.023
n-Butylbenzene	ND		0.023
1,2-Dibromo-3-chloropropane	ND		0.12
1,2,4-Trichlorobenzene	ND		0.023
Hexachlorobutadiene	ND		0.12
Naphthalene	0.027		0.023
1,2,3-Trichlorobenzene	ND		0.023

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	101	70-118
Toluene-d8	105	70-121
4-Bromofluorobenzene	104	70-130

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
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Date Extracted: 7-25-08
Date Analyzed: 8-1&4-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-18
Client ID: 084AG118SB

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.023
Chloromethane	ND		0.12
Vinyl Chloride	ND		0.023
Bromomethane	ND		0.023
Chloroethane	ND		0.12
Trichlorofluoromethane	ND		0.023
1,1-Dichloroethene	ND		0.023
Acetone	ND		0.12
Iodomethane	ND		0.12
Carbon Disulfide	ND		0.023
Methylene Chloride	ND		0.12
(trans) 1,2-Dichloroethene	ND		0.023
Methyl t-Butyl Ether	ND		0.023
1,1-Dichloroethane	ND		0.023
Vinyl Acetate	ND		0.12
2,2-Dichloropropane	ND		0.023
(cis) 1,2-Dichloroethene	ND		0.023
2-Butanone	ND		0.12
Bromochloromethane	ND		0.023
Chloroform	ND		0.023
1,1,1-Trichloroethane	ND		0.023
Carbon Tetrachloride	ND		0.023
1,1-Dichloropropene	ND		0.023
Benzene	ND		0.023
1,2-Dichloroethane	ND		0.023
Trichloroethene	ND		0.023
1,2-Dichloropropane	ND		0.023
Dibromomethane	ND		0.023
Bromodichloromethane	ND		0.023
2-Chloroethyl Vinyl Ether	ND		0.12
(cis) 1,3-Dichloropropene	ND		0.023
Methyl Isobutyl Ketone	ND		0.12
Toluene	ND		0.12
(trans) 1,3-Dichloropropene	ND		0.023

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

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Lab ID: 07-225-18
Client ID: 084AG118SB

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.023
Tetrachloroethene	45		0.46
1,3-Dichloropropane	ND		0.023
2-Hexanone	ND		0.12
Dibromochloromethane	ND		0.023
1,2-Dibromoethane	ND		0.023
Chlorobenzene	ND		0.023
1,1,1,2-Tetrachloroethane	ND		0.023
Ethylbenzene	ND		0.023
m,p-Xylene	ND		0.046
o-Xylene	ND		0.023
Styrene	ND		0.023
Bromoform	ND		0.023
Isopropylbenzene	ND		0.023
Bromobenzene	ND		0.023
1,1,2,2-Tetrachloroethane	ND		0.023
1,2,3-Trichloropropane	ND		0.023
n-Propylbenzene	ND		0.023
2-Chlorotoluene	ND		0.023
4-Chlorotoluene	ND		0.023
1,3,5-Trimethylbenzene	ND		0.023
tert-Butylbenzene	ND		0.023
1,2,4-Trimethylbenzene	ND		0.023
sec-Butylbenzene	ND		0.023
1,3-Dichlorobenzene	ND		0.023
p-Isopropyltoluene	ND		0.023
1,4-Dichlorobenzene	ND		0.023
1,2-Dichlorobenzene	ND		0.023
n-Butylbenzene	ND		0.023
1,2-Dibromo-3-chloropropane	ND		0.12
1,2,4-Trichlorobenzene	ND		0.023
Hexachlorobutadiene	ND		0.12
Naphthalene	ND		0.023
1,2,3-Trichlorobenzene	ND		0.023

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	102	70-118
Toluene-d8	103	70-121
4-Bromofluorobenzene	104	70-130

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
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Date Extracted: 7-22-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-19
Client ID: 084AG119TB

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.050
Chloromethane	ND		0.25
Vinyl Chloride	ND		0.050
Bromomethane	ND		0.050
Chloroethane	ND		0.25
Trichlorofluoromethane	ND		0.050
1,1-Dichloroethene	ND		0.050
Acetone	ND		0.25
Iodomethane	ND		0.25
Carbon Disulfide	ND		0.050
Methylene Chloride	ND		0.25
(trans) 1,2-Dichloroethene	ND		0.050
Methyl t-Butyl Ether	ND		0.050
1,1-Dichloroethane	ND		0.050
Vinyl Acetate	ND		0.25
2,2-Dichloropropane	ND		0.050
(cis) 1,2-Dichloroethene	ND		0.050
2-Butanone	ND		0.25
Bromochloromethane	ND		0.050
Chloroform	ND		0.050
1,1,1-Trichloroethane	ND		0.050
Carbon Tetrachloride	ND		0.050
1,1-Dichloropropene	ND		0.050
Benzene	ND		0.050
1,2-Dichloroethane	ND		0.050
Trichloroethene	ND		0.050
1,2-Dichloropropane	ND		0.050
Dibromomethane	ND		0.050
Bromodichloromethane	ND		0.050
2-Chloroethyl Vinyl Ether	ND		0.25
(cis) 1,3-Dichloropropene	ND		0.050
Methyl Isobutyl Ketone	ND		0.25
Toluene	ND		0.25
(trans) 1,3-Dichloropropene	ND		0.050

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
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Lab ID: 07-225-19
Client ID: 084AG119TB

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.050
Tetrachloroethene	ND		0.050
1,3-Dichloropropane	ND		0.050
2-Hexanone	ND		0.25
Dibromochloromethane	ND		0.050
1,2-Dibromoethane	ND		0.050
Chlorobenzene	ND		0.050
1,1,1,2-Tetrachloroethane	ND		0.050
Ethylbenzene	ND		0.050
m,p-Xylene	ND		0.10
o-Xylene	ND		0.050
Styrene	ND		0.050
Bromoform	ND		0.050
Isopropylbenzene	ND		0.050
Bromobenzene	ND		0.050
1,1,2,2-Tetrachloroethane	ND		0.050
1,2,3-Trichloropropane	ND		0.050
n-Propylbenzene	ND		0.050
2-Chlorotoluene	ND		0.050
4-Chlorotoluene	ND		0.050
1,3,5-Trimethylbenzene	ND		0.050
tert-Butylbenzene	ND		0.050
1,2,4-Trimethylbenzene	ND		0.050
sec-Butylbenzene	ND		0.050
1,3-Dichlorobenzene	ND		0.050
p-Isopropyltoluene	ND		0.050
1,4-Dichlorobenzene	ND		0.050
1,2-Dichlorobenzene	ND		0.050
n-Butylbenzene	ND		0.050
1,2-Dibromo-3-chloropropane	ND		0.25
1,2,4-Trichlorobenzene	ND		0.050
Hexachlorobutadiene	ND		0.25
Naphthalene	ND		0.050
1,2,3-Trichlorobenzene	ND		0.050

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	98	70-118
Toluene-d8	94	70-121
4-Bromofluorobenzene	99	70-130

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
METHOD BLANK QUALITY CONTROL
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Date Extracted: 8-1-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: MB0801S1

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.0010
Chloromethane	ND		0.0050
Vinyl Chloride	ND		0.0010
Bromomethane	ND		0.0010
Chloroethane	ND		0.0050
Trichlorofluoromethane	ND		0.0010
1,1-Dichloroethene	ND		0.0010
Acetone	ND		0.0050
Iodomethane	ND		0.0050
Carbon Disulfide	ND		0.0010
Methylene Chloride	ND		0.0050
(trans) 1,2-Dichloroethene	ND		0.0010
Methyl t-Butyl Ether	ND		0.0010
1,1-Dichloroethane	ND		0.0010
Vinyl Acetate	ND		0.0050
2,2-Dichloropropane	ND		0.0010
(cis) 1,2-Dichloroethene	ND		0.0010
2-Butanone	ND		0.0050
Bromochloromethane	ND		0.0010
Chloroform	ND		0.0010
1,1,1-Trichloroethane	ND		0.0010
Carbon Tetrachloride	ND		0.0010
1,1-Dichloropropene	ND		0.0010
Benzene	ND		0.0010
1,2-Dichloroethane	ND		0.0010
Trichloroethene	ND		0.0010
1,2-Dichloropropane	ND		0.0010
Dibromomethane	ND		0.0010
Bromodichloromethane	ND		0.0010
2-Chloroethyl Vinyl Ether	ND		0.0050
(cis) 1,3-Dichloropropene	ND		0.0010
Methyl Isobutyl Ketone	ND		0.0050
Toluene	ND		0.0050
(trans) 1,3-Dichloropropene	ND		0.0010

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VOLATILES by EPA 8260B
METHOD BLANK QUALITY CONTROL
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Lab ID: MB0801S1

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.0010
Tetrachloroethene	ND		0.0010
1,3-Dichloropropane	ND		0.0010
2-Hexanone	ND		0.0050
Dibromochloromethane	ND		0.0010
1,2-Dibromoethane	ND		0.0010
Chlorobenzene	ND		0.0010
1,1,1,2-Tetrachloroethane	ND		0.0010
Ethylbenzene	ND		0.0010
m,p-Xylene	ND		0.0020
o-Xylene	ND		0.0010
Styrene	ND		0.0010
Bromoform	ND		0.0010
Isopropylbenzene	ND		0.0010
Bromobenzene	ND		0.0010
1,1,2,2-Tetrachloroethane	ND		0.0010
1,2,3-Trichloropropane	ND		0.0010
n-Propylbenzene	ND		0.0010
2-Chlorotoluene	ND		0.0010
4-Chlorotoluene	ND		0.0010
1,3,5-Trimethylbenzene	ND		0.0010
tert-Butylbenzene	ND		0.0010
1,2,4-Trimethylbenzene	ND		0.0010
sec-Butylbenzene	ND		0.0010
1,3-Dichlorobenzene	ND		0.0010
p-Isopropyltoluene	ND		0.0010
1,4-Dichlorobenzene	ND		0.0010
1,2-Dichlorobenzene	ND		0.0010
n-Butylbenzene	ND		0.0010
1,2-Dibromo-3-chloropropane	ND		0.0050
1,2,4-Trichlorobenzene	ND		0.0010
Hexachlorobutadiene	ND		0.0050
Naphthalene	ND		0.0010
1,2,3-Trichlorobenzene	ND		0.0010

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	99	70-118
Toluene-d8	91	70-121
4-Bromofluorobenzene	92	70-130

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

VOLATILES by EPA 8260B
SB/SBD QUALITY CONTROL

Date Extracted: 8-1-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: SB0801S1

Compound	Spike Amount	SB	Percent Recovery	SBD	Percent Recovery	Recovery Limits	Flags
1,1-Dichloroethene	0.0500	0.0530	106	0.0499	100	70-130	
Benzene	0.0500	0.0474	95	0.0442	88	70-128	
Trichloroethene	0.0500	0.0470	94	0.0450	90	73-121	
Toluene	0.0500	0.0454	91	0.0437	87	74-122	
Chlorobenzene	0.0500	0.0444	89	0.0412	82	76-115	

	RPD	RPD Limit	Flags
1,1-Dichloroethene	6	15	
Benzene	7	12	
Trichloroethene	4	17	
Toluene	4	14	
Chlorobenzene	8	13	

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Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

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Date Extracted: 8-4-08
Date Analyzed: 8-4-08

Matrix: Water
Units: ug/L (ppb)

Lab ID: 07-225-01
Client ID: 084AG101GW

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		10
Chloromethane	ND		50
Vinyl Chloride	ND		10
Bromomethane	ND		10
Chloroethane	ND		50
Trichlorofluoromethane	ND		10
1,1-Dichloroethene	ND		10
Acetone	ND		250
Iodomethane	ND		50
Carbon Disulfide	ND		10
Methylene Chloride	ND		50
(trans) 1,2-Dichloroethene	ND		10
Methyl t-Butyl Ether	ND		10
1,1-Dichloroethane	ND		10
Vinyl Acetate	ND		100
2,2-Dichloropropane	ND		10
(cis) 1,2-Dichloroethene	ND		10
2-Butanone	ND		250
Bromochloromethane	ND		10
Chloroform	ND		10
1,1,1-Trichloroethane	ND		10
Carbon Tetrachloride	ND		10
1,1-Dichloropropene	ND		10
Benzene	ND		10
1,2-Dichloroethane	ND		10
Trichloroethene	ND		10
1,2-Dichloropropane	ND		10
Dibromomethane	ND		10
Bromodichloromethane	ND		10
2-Chloroethyl Vinyl Ether	ND		50
(cis) 1,3-Dichloropropene	ND		10
Methyl Isobutyl Ketone	ND		100
Toluene	ND		50
(trans) 1,3-Dichloropropene	ND		10

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

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Lab ID: 07-225-01
Client ID: 084AG101GW

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		10
Tetrachloroethene	1600		10
1,3-Dichloropropane	ND		10
2-Hexanone	ND		100
Dibromochloromethane	ND		10
1,2-Dibromoethane	ND		10
Chlorobenzene	ND		10
1,1,1,2-Tetrachloroethane	ND		10
Ethylbenzene	ND		10
m,p-Xylene	ND		20
o-Xylene	ND		10
Styrene	ND		10
Bromoform	ND		50
Isopropylbenzene	ND		10
Bromobenzene	ND		10
1,1,2,2-Tetrachloroethane	ND		10
1,2,3-Trichloropropane	ND		10
n-Propylbenzene	ND		10
2-Chlorotoluene	ND		10
4-Chlorotoluene	ND		10
1,3,5-Trimethylbenzene	ND		10
tert-Butylbenzene	ND		10
1,2,4-Trimethylbenzene	ND		10
sec-Butylbenzene	ND		10
1,3-Dichlorobenzene	ND		10
p-Isopropyltoluene	ND		10
1,4-Dichlorobenzene	ND		10
1,2-Dichlorobenzene	ND		10
n-Butylbenzene	ND		10
1,2-Dibromo-3-chloropropane	ND		50
1,2,4-Trichlorobenzene	ND		10
Hexachlorobutadiene	ND		10
Naphthalene	ND		50
1,2,3-Trichlorobenzene	ND		10

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	78	71-126
Toluene-d8	77	76-116
4-Bromofluorobenzene	75	70-123

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Date Extracted: 8-4-08
Date Analyzed: 8-4-08

Matrix: Water
Units: ug/L (ppb)

Lab ID: 07-225-02
Client ID: 084AG102GW

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		10
Chloromethane	ND		50
Vinyl Chloride	ND		10
Bromomethane	ND		10
Chloroethane	ND		50
Trichlorofluoromethane	ND		10
1,1-Dichloroethene	ND		10
Acetone	ND		250
Iodomethane	ND		50
Carbon Disulfide	ND		10
Methylene Chloride	ND		50
(trans) 1,2-Dichloroethene	ND		10
Methyl t-Butyl Ether	ND		10
1,1-Dichloroethane	ND		10
Vinyl Acetate	ND		100
2,2-Dichloropropane	ND		10
(cis) 1,2-Dichloroethene	ND		10
2-Butanone	ND		250
Bromochloromethane	ND		10
Chloroform	ND		10
1,1,1-Trichloroethane	ND		10
Carbon Tetrachloride	ND		10
1,1-Dichloropropene	ND		10
Benzene	ND		10
1,2-Dichloroethane	ND		10
Trichloroethene	ND		10
1,2-Dichloropropane	ND		10
Dibromomethane	ND		10
Bromodichloromethane	ND		10
2-Chloroethyl Vinyl Ether	ND		50
(cis) 1,3-Dichloropropene	ND		10
Methyl Isobutyl Ketone	ND		100
Toluene	ND		50
(trans) 1,3-Dichloropropene	ND		10

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Date of Report: August 11, 2008
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Lab ID: 07-225-02
Client ID: 084AG102GW

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		10
Tetrachloroethene	1600		10
1,3-Dichloropropane	ND		10
2-Hexanone	ND		100
Dibromochloromethane	ND		10
1,2-Dibromoethane	ND		10
Chlorobenzene	ND		10
1,1,1,2-Tetrachloroethane	ND		10
Ethylbenzene	ND		10
m,p-Xylene	ND		20
o-Xylene	ND		10
Styrene	ND		10
Bromoform	ND		50
Isopropylbenzene	ND		10
Bromobenzene	ND		10
1,1,2,2-Tetrachloroethane	ND		10
1,2,3-Trichloropropane	ND		10
n-Propylbenzene	ND		10
2-Chlorotoluene	ND		10
4-Chlorotoluene	ND		10
1,3,5-Trimethylbenzene	ND		10
tert-Butylbenzene	ND		10
1,2,4-Trimethylbenzene	ND		10
sec-Butylbenzene	ND		10
1,3-Dichlorobenzene	ND		10
p-Isopropyltoluene	ND		10
1,4-Dichlorobenzene	ND		10
1,2-Dichlorobenzene	ND		10
n-Butylbenzene	ND		10
1,2-Dibromo-3-chloropropane	ND		50
1,2,4-Trichlorobenzene	ND		10
Hexachlorobutadiene	ND		10
Naphthalene	ND		50
1,2,3-Trichlorobenzene	ND		10

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	80	71-126
Toluene-d8	78	76-116
4-Bromofluorobenzene	76	70-123

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Date Extracted: 8-4-08
Date Analyzed: 8-4-08

Matrix: Water
Units: ug/L (ppb)

Lab ID: 07-225-04
Client ID: 084AG104GW

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		2.0
Chloromethane	ND		10
Vinyl Chloride	ND		2.0
Bromomethane	ND		2.0
Chloroethane	ND		10
Trichlorofluoromethane	ND		2.0
1,1-Dichloroethene	ND		2.0
Acetone	ND		50
Iodomethane	ND		10
Carbon Disulfide	ND		2.0
Methylene Chloride	ND		10
(trans) 1,2-Dichloroethene	ND		2.0
Methyl t-Butyl Ether	ND		2.0
1,1-Dichloroethane	ND		2.0
Vinyl Acetate	ND		20
2,2-Dichloropropane	ND		2.0
(cis) 1,2-Dichloroethene	ND		2.0
2-Butanone	ND		50
Bromochloromethane	ND		2.0
Chloroform	ND		2.0
1,1,1-Trichloroethane	ND		2.0
Carbon Tetrachloride	ND		2.0
1,1-Dichloropropene	ND		2.0
Benzene	ND		2.0
1,2-Dichloroethane	ND		2.0
Trichloroethene	ND		2.0
1,2-Dichloropropane	ND		2.0
Dibromomethane	ND		2.0
Bromodichloromethane	ND		2.0
2-Chloroethyl Vinyl Ether	ND		10
(cis) 1,3-Dichloropropene	ND		2.0
Methyl Isobutyl Ketone	ND		20
Toluene	ND		10
(trans) 1,3-Dichloropropene	ND		2.0

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Lab ID: 07-225-04
Client ID: 084AG104GW

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		2.0
Tetrachloroethene	290		2.0
1,3-Dichloropropane	ND		2.0
2-Hexanone	ND		20
Dibromochloromethane	ND		2.0
1,2-Dibromoethane	ND		2.0
Chlorobenzene	ND		2.0
1,1,1,2-Tetrachloroethane	ND		2.0
Ethylbenzene	ND		2.0
m,p-Xylene	ND		4.0
o-Xylene	ND		2.0
Styrene	ND		2.0
Bromoform	ND		10
Isopropylbenzene	ND		2.0
Bromobenzene	ND		2.0
1,1,2,2-Tetrachloroethane	ND		2.0
1,2,3-Trichloropropane	ND		2.0
n-Propylbenzene	ND		2.0
2-Chlorotoluene	ND		2.0
4-Chlorotoluene	ND		2.0
1,3,5-Trimethylbenzene	ND		2.0
tert-Butylbenzene	ND		2.0
1,2,4-Trimethylbenzene	ND		2.0
sec-Butylbenzene	ND		2.0
1,3-Dichlorobenzene	ND		2.0
p-Isopropyltoluene	ND		2.0
1,4-Dichlorobenzene	ND		2.0
1,2-Dichlorobenzene	ND		2.0
n-Butylbenzene	ND		2.0
1,2-Dibromo-3-chloropropane	ND		10
1,2,4-Trichlorobenzene	ND		2.0
Hexachlorobutadiene	ND		2.0
Naphthalene	ND		10
1,2,3-Trichlorobenzene	ND		2.0

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	79	71-126
Toluene-d8	78	76-116
4-Bromofluorobenzene	74	70-123

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Date Extracted: 8-4-08
Date Analyzed: 8-4-08

Matrix: Water
Units: ug/L (ppb)

Lab ID: 07-225-13
Client ID: 084AG113GW

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.20
Chloromethane	ND		1.0
Vinyl Chloride	ND		0.20
Bromomethane	ND		0.20
Chloroethane	ND		1.0
Trichlorofluoromethane	ND		0.20
1,1-Dichloroethene	ND		0.20
Acetone	ND		5.0
Iodomethane	ND		1.0
Carbon Disulfide	ND		0.20
Methylene Chloride	ND		1.0
(trans) 1,2-Dichloroethene	ND		0.20
Methyl t-Butyl Ether	ND		0.20
1,1-Dichloroethane	ND		0.20
Vinyl Acetate	ND		2.0
2,2-Dichloropropane	ND		0.20
(cis) 1,2-Dichloroethene	ND		0.20
2-Butanone	ND		5.0
Bromochloromethane	ND		0.20
Chloroform	6.1		0.20
1,1,1-Trichloroethane	ND		0.20
Carbon Tetrachloride	ND		0.20
1,1-Dichloropropene	ND		0.20
Benzene	ND		0.20
1,2-Dichloroethane	ND		0.20
Trichloroethene	ND		0.20
1,2-Dichloropropane	ND		0.20
Dibromomethane	ND		0.20
Bromodichloromethane	ND		0.20
2-Chloroethyl Vinyl Ether	ND		1.0
(cis) 1,3-Dichloropropene	ND		0.20
Methyl Isobutyl Ketone	ND		2.0
Toluene	ND		1.0
(trans) 1,3-Dichloropropene	ND		0.20

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
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Lab ID: 07-225-13
Client ID: 084AG113GW

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.20
Tetrachloroethene	ND		0.20
1,3-Dichloropropane	ND		0.20
2-Hexanone	ND		2.0
Dibromochloromethane	ND		0.20
1,2-Dibromoethane	ND		0.20
Chlorobenzene	ND		0.20
1,1,1,2-Tetrachloroethane	ND		0.20
Ethylbenzene	ND		0.20
m,p-Xylene	ND		0.40
o-Xylene	ND		0.20
Styrene	ND		0.20
Bromoform	ND		1.0
Isopropylbenzene	ND		0.20
Bromobenzene	ND		0.20
1,1,2,2-Tetrachloroethane	ND		0.20
1,2,3-Trichloropropane	ND		0.20
n-Propylbenzene	ND		0.20
2-Chlorotoluene	ND		0.20
4-Chlorotoluene	ND		0.20
1,3,5-Trimethylbenzene	ND		0.20
tert-Butylbenzene	ND		0.20
1,2,4-Trimethylbenzene	ND		0.20
sec-Butylbenzene	ND		0.20
1,3-Dichlorobenzene	ND		0.20
p-Isopropyltoluene	ND		0.20
1,4-Dichlorobenzene	ND		0.20
1,2-Dichlorobenzene	ND		0.20
n-Butylbenzene	ND		0.20
1,2-Dibromo-3-chloropropane	ND		1.0
1,2,4-Trichlorobenzene	ND		0.20
Hexachlorobutadiene	ND		0.20
Naphthalene	ND		1.0
1,2,3-Trichlorobenzene	ND		0.20

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	79	71-126
Toluene-d8	77	76-116
4-Bromofluorobenzene	77	70-123

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date Extracted: 8-4-08
Date Analyzed: 8-4-08

Matrix: Water
Units: ug/L (ppb)

Lab ID: 07-225-21
Client ID: 084AG121TB

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.20
Chloromethane	ND		1.0
Vinyl Chloride	ND		0.20
Bromomethane	ND		0.20
Chloroethane	ND		1.0
Trichlorofluoromethane	ND		0.20
1,1-Dichloroethene	ND		0.20
Acetone	ND		5.0
Iodomethane	ND		1.0
Carbon Disulfide	ND		0.20
Methylene Chloride	ND		1.0
(trans) 1,2-Dichloroethene	ND		0.20
Methyl t-Butyl Ether	ND		0.20
1,1-Dichloroethane	ND		0.20
Vinyl Acetate	ND		2.0
2,2-Dichloropropane	ND		0.20
(cis) 1,2-Dichloroethene	ND		0.20
2-Butanone	ND		5.0
Bromochloromethane	ND		0.20
Chloroform	ND		0.20
1,1,1-Trichloroethane	ND		0.20
Carbon Tetrachloride	ND		0.20
1,1-Dichloropropene	ND		0.20
Benzene	ND		0.20
1,2-Dichloroethane	ND		0.20
Trichloroethene	ND		0.20
1,2-Dichloropropane	ND		0.20
Dibromomethane	ND		0.20
Bromodichloromethane	ND		0.20
2-Chloroethyl Vinyl Ether	ND		1.0
(cis) 1,3-Dichloropropene	ND		0.20
Methyl Isobutyl Ketone	ND		2.0
Toluene	ND		1.0
(trans) 1,3-Dichloropropene	ND		0.20

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Lab ID: 07-225-21
Client ID: 084AG121TB

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.20
Tetrachloroethene	ND		0.20
1,3-Dichloropropane	ND		0.20
2-Hexanone	ND		2.0
Dibromochloromethane	ND		0.20
1,2-Dibromoethane	ND		0.20
Chlorobenzene	ND		0.20
1,1,1,2-Tetrachloroethane	ND		0.20
Ethylbenzene	ND		0.20
m,p-Xylene	ND		0.40
o-Xylene	ND		0.20
Styrene	ND		0.20
Bromoform	ND		1.0
Isopropylbenzene	ND		0.20
Bromobenzene	ND		0.20
1,1,2,2-Tetrachloroethane	ND		0.20
1,2,3-Trichloropropane	ND		0.20
n-Propylbenzene	ND		0.20
2-Chlorotoluene	ND		0.20
4-Chlorotoluene	ND		0.20
1,3,5-Trimethylbenzene	ND		0.20
tert-Butylbenzene	ND		0.20
1,2,4-Trimethylbenzene	ND		0.20
sec-Butylbenzene	ND		0.20
1,3-Dichlorobenzene	ND		0.20
p-Isopropyltoluene	ND		0.20
1,4-Dichlorobenzene	ND		0.20
1,2-Dichlorobenzene	ND		0.20
n-Butylbenzene	ND		0.20
1,2-Dibromo-3-chloropropane	ND		1.0
1,2,4-Trichlorobenzene	ND		0.20
Hexachlorobutadiene	ND		0.20
Naphthalene	ND		1.0
1,2,3-Trichlorobenzene	ND		0.20

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	78	71-126
Toluene-d8	78	76-116
4-Bromofluorobenzene	76	70-123

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Date Extracted: 8-4-08
Date Analyzed: 8-4-08

Matrix: Water
Units: ug/L (ppb)

Lab ID: 07-225-22
Client ID: 084AG122GW

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		2.0
Chloromethane	ND		10
Vinyl Chloride	ND		2.0
Bromomethane	ND		2.0
Chloroethane	ND		10
Trichlorofluoromethane	ND		2.0
1,1-Dichloroethene	ND		2.0
Acetone	ND		50
Iodomethane	ND		10
Carbon Disulfide	ND		2.0
Methylene Chloride	ND		10
(trans) 1,2-Dichloroethene	ND		2.0
Methyl t-Butyl Ether	ND		2.0
1,1-Dichloroethane	ND		2.0
Vinyl Acetate	ND		20
2,2-Dichloropropane	ND		2.0
(cis) 1,2-Dichloroethene	ND		2.0
2-Butanone	ND		50
Bromochloromethane	ND		2.0
Chloroform	ND		2.0
1,1,1-Trichloroethane	ND		2.0
Carbon Tetrachloride	ND		2.0
1,1-Dichloropropene	ND		2.0
Benzene	ND		2.0
1,2-Dichloroethane	ND		2.0
Trichloroethene	ND		2.0
1,2-Dichloropropane	ND		2.0
Dibromomethane	ND		2.0
Bromodichloromethane	ND		2.0
2-Chloroethyl Vinyl Ether	ND		10
(cis) 1,3-Dichloropropene	ND		2.0
Methyl Isobutyl Ketone	ND		20
Toluene	ND		10
(trans) 1,3-Dichloropropene	ND		2.0

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Lab ID: 07-225-22
Client ID: 084AG122GW

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		2.0
Tetrachloroethene	320		2.0
1,3-Dichloropropane	ND		2.0
2-Hexanone	ND		20
Dibromochloromethane	ND		2.0
1,2-Dibromoethane	ND		2.0
Chlorobenzene	ND		2.0
1,1,1,2-Tetrachloroethane	ND		2.0
Ethylbenzene	ND		2.0
m,p-Xylene	ND		4.0
o-Xylene	ND		2.0
Styrene	ND		2.0
Bromoform	ND		10
Isopropylbenzene	ND		2.0
Bromobenzene	ND		2.0
1,1,2,2-Tetrachloroethane	ND		2.0
1,2,3-Trichloropropane	ND		2.0
n-Propylbenzene	ND		2.0
2-Chlorotoluene	ND		2.0
4-Chlorotoluene	ND		2.0
1,3,5-Trimethylbenzene	ND		2.0
tert-Butylbenzene	ND		2.0
1,2,4-Trimethylbenzene	ND		2.0
sec-Butylbenzene	ND		2.0
1,3-Dichlorobenzene	ND		2.0
p-Isopropyltoluene	ND		2.0
1,4-Dichlorobenzene	ND		2.0
1,2-Dichlorobenzene	ND		2.0
n-Butylbenzene	ND		2.0
1,2-Dibromo-3-chloropropane	ND		10
1,2,4-Trichlorobenzene	ND		2.0
Hexachlorobutadiene	ND		2.0
Naphthalene	ND		10
1,2,3-Trichlorobenzene	ND		2.0

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	79	71-126
Toluene-d8	77	76-116
4-Bromofluorobenzene	73	70-123

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Date Extracted: 8-4-08
Date Analyzed: 8-4-08

Matrix: Water
Units: ug/L (ppb)

Lab ID: 07-225-23
Client ID: 084AG123WA

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		1.0
Chloromethane	ND		5.0
Vinyl Chloride	ND		1.0
Bromomethane	ND		1.0
Chloroethane	ND		5.0
Trichlorofluoromethane	ND		1.0
1,1-Dichloroethene	ND		1.0
Acetone	ND		25
Iodomethane	ND		5.0
Carbon Disulfide	ND		1.0
Methylene Chloride	ND		5.0
(trans) 1,2-Dichloroethene	ND		1.0
Methyl t-Butyl Ether	ND		1.0
1,1-Dichloroethane	ND		1.0
Vinyl Acetate	ND		10
2,2-Dichloropropane	ND		1.0
(cis) 1,2-Dichloroethene	ND		1.0
2-Butanone	ND		25
Bromochloromethane	ND		1.0
Chloroform	1.7		1.0
1,1,1-Trichloroethane	ND		1.0
Carbon Tetrachloride	ND		1.0
1,1-Dichloropropene	ND		1.0
Benzene	ND		1.0
1,2-Dichloroethane	ND		1.0
Trichloroethene	ND		1.0
1,2-Dichloropropane	ND		1.0
Dibromomethane	ND		1.0
Bromodichloromethane	ND		1.0
2-Chloroethyl Vinyl Ether	ND		5.0
(cis) 1,3-Dichloropropene	ND		1.0
Methyl Isobutyl Ketone	ND		10
Toluene	ND		5.0
(trans) 1,3-Dichloropropene	ND		1.0

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Lab ID: 07-225-23
Client ID: 084AG123WA

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		1.0
Tetrachloroethene	110		1.0
1,3-Dichloropropane	ND		1.0
2-Hexanone	ND		10
Dibromochloromethane	ND		1.0
1,2-Dibromoethane	ND		1.0
Chlorobenzene	ND		1.0
1,1,1,2-Tetrachloroethane	ND		1.0
Ethylbenzene	ND		1.0
m,p-Xylene	4.1		2.0
o-Xylene	4.7		1.0
Styrene	ND		1.0
Bromoform	ND		5.0
Isopropylbenzene	ND		1.0
Bromobenzene	ND		1.0
1,1,2,2-Tetrachloroethane	ND		1.0
1,2,3-Trichloropropane	ND		1.0
n-Propylbenzene	ND		1.0
2-Chlorotoluene	ND		1.0
4-Chlorotoluene	ND		1.0
1,3,5-Trimethylbenzene	ND		1.0
tert-Butylbenzene	ND		1.0
1,2,4-Trimethylbenzene	1.9		1.0
sec-Butylbenzene	ND		1.0
1,3-Dichlorobenzene	ND		1.0
p-Isopropyltoluene	ND		1.0
1,4-Dichlorobenzene	ND		1.0
1,2-Dichlorobenzene	ND		1.0
n-Butylbenzene	ND		1.0
1,2-Dibromo-3-chloropropane	ND		5.0
1,2,4-Trichlorobenzene	ND		1.0
Hexachlorobutadiene	ND		1.0
Naphthalene	ND		5.0
1,2,3-Trichlorobenzene	ND		1.0

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	78	71-126
Toluene-d8	77	76-116
4-Bromofluorobenzene	78	70-123

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VOLATILES by EPA 8260B
METHOD BLANK QUALITY CONTROL
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Date Extracted: 8-4-08
Date Analyzed: 8-4-08

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0804W1

Compound	Results	Flags	PQL
Dichlorodifluoromethane	ND		0.20
Chloromethane	ND		1.0
Vinyl Chloride	ND		0.20
Bromomethane	ND		0.20
Chloroethane	ND		1.0
Trichlorofluoromethane	ND		0.20
1,1-Dichloroethene	ND		0.20
Acetone	ND		5.0
Iodomethane	ND		1.0
Carbon Disulfide	ND		0.20
Methylene Chloride	ND		1.0
(trans) 1,2-Dichloroethene	ND		0.20
Methyl t-Butyl Ether	ND		0.20
1,1-Dichloroethane	ND		0.20
Vinyl Acetate	ND		2.0
2,2-Dichloropropane	ND		0.20
(cis) 1,2-Dichloroethene	ND		0.20
2-Butanone	ND		5.0
Bromochloromethane	ND		0.20
Chloroform	ND		0.20
1,1,1-Trichloroethane	ND		0.20
Carbon Tetrachloride	ND		0.20
1,1-Dichloropropene	ND		0.20
Benzene	ND		0.20
1,2-Dichloroethane	ND		0.20
Trichloroethene	ND		0.20
1,2-Dichloropropane	ND		0.20
Dibromomethane	ND		0.20
Bromodichloromethane	ND		0.20
2-Chloroethyl Vinyl Ether	ND		1.0
(cis) 1,3-Dichloropropene	ND		0.20
Methyl Isobutyl Ketone	ND		2.0
Toluene	ND		1.0
(trans) 1,3-Dichloropropene	ND		0.20

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METHOD BLANK QUALITY CONTROL
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Lab ID: MB0804W1

Compound	Results	Flags	PQL
1,1,2-Trichloroethane	ND		0.20
Tetrachloroethene	ND		0.20
1,3-Dichloropropane	ND		0.20
2-Hexanone	ND		2.0
Dibromochloromethane	ND		0.20
1,2-Dibromoethane	ND		0.20
Chlorobenzene	ND		0.20
1,1,1,2-Tetrachloroethane	ND		0.20
Ethylbenzene	ND		0.20
m,p-Xylene	ND		0.40
o-Xylene	ND		0.20
Styrene	ND		0.20
Bromoform	ND		1.0
Isopropylbenzene	ND		0.20
Bromobenzene	ND		0.20
1,1,2,2-Tetrachloroethane	ND		0.20
1,2,3-Trichloropropane	ND		0.20
n-Propylbenzene	ND		0.20
2-Chlorotoluene	ND		0.20
4-Chlorotoluene	ND		0.20
1,3,5-Trimethylbenzene	ND		0.20
tert-Butylbenzene	ND		0.20
1,2,4-Trimethylbenzene	ND		0.20
sec-Butylbenzene	ND		0.20
1,3-Dichlorobenzene	ND		0.20
p-Isopropyltoluene	ND		0.20
1,4-Dichlorobenzene	ND		0.20
1,2-Dichlorobenzene	ND		0.20
n-Butylbenzene	ND		0.20
1,2-Dibromo-3-chloropropane	ND		1.0
1,2,4-Trichlorobenzene	ND		0.20
Hexachlorobutadiene	ND		0.20
Naphthalene	ND		1.0
1,2,3-Trichlorobenzene	ND		0.20

Surrogate	Percent Recovery	Control Limits
Dibromofluoromethane	77	71-126
Toluene-d8	77	76-116
4-Bromofluorobenzene	74	70-123

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VOLATILES by EPA 8260B
MS/MSD QUALITY CONTROL

Date Extracted: 8-4-08
Date Analyzed: 8-4-08

Matrix: Water
Units: ug/L (ppb)

Lab ID: 07-225-13

Compound	Sample Amount	Spike Amount	MS	Percent Recovery	MSD	Percent Recovery	Recovery Limits	Flags
1,1-Dichloroethene	ND	10.0	10.8	108	10.3	103	70-130	
Benzene	ND	10.0	10.6	106	10.2	102	70-130	
Trichloroethene	ND	10.0	9.72	97	9.85	99	77-114	
Toluene	0.380	10.0	10.8	104	10.6	102	79-121	
Chlorobenzene	ND	10.0	9.86	99	9.71	97	77-108	

	RPD	RPD Limit	Flags
1,1-Dichloroethene	4	11	
Benzene	4	11	
Trichloroethene	1	10	
Toluene	1	11	
Chlorobenzene	2	10	

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

GRO AK101

Date Extracted: 8-1-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**084AG103SB**			**084AG105SB**		
Lab ID:	07-225-03			07-225-05		
	Result	Flags	PQL	**Result**	Flags	PQL
Alaska GRO (C6 TO C10)	**ND**		2.4	**6.6**	**Z**	1.9
Surrogate Recovery:						
Fluorobenzene	81%			74%		

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

GRO AK101

Date Extracted:	8-1-08	
Date Analyzed:	8-1-08	
Matrix: Soil		
Units: mg/kg (ppm)		
Client ID:	**084AG106SB**	**084AG107SB**
Lab ID:	07-225-06	07-225-07

	Result	Flags	PQL	**Result**	Flags	PQL
Alaska GRO (C6 TO C10)	**8.6**	**Z**	2.0	**22**	**Z**	2.6
Surrogate Recovery:						
Fluorobenzene	77%			78%		

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Laboratory Reference: 0807-225
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GRO AK101

Date Extracted: 8-1-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**084AG108SB**			**084AG109SB**		
Lab ID:	07-225-08			07-225-09		
	Result	Flags	PQL	**Result**	Flags	PQL
Alaska GRO (C6 TO C10)	**ND**		3.0	**2.4**	**Z**	2.2
Surrogate Recovery:						
Fluorobenzene	68%			84%		

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GRO AK101

Date Extracted:	8-1-08	
Date Analyzed:	8-1-08	
Matrix: Soil		
Units: mg/kg (ppm)		
Client ID:	**084AG110SB**	**084AG111SB**
Lab ID:	07-225-10	07-225-11

	Result	Flags	PQL	**Result**	Flags	PQL
Alaska GRO (C6 TO C10)	**ND**		2.8	**ND**		3.3
Surrogate Recovery:						
Fluorobenzene	84%			84%		

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GRO AK101

Date Extracted: 8-1-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**084AG112SB**			**084AG114SB**		
Lab ID:	07-225-12			07-225-14		
	Result	Flags	PQL	**Result**	Flags	PQL
Alaska GRO (C6 TO C10)	**ND**		1.9	**ND**		2.5
Surrogate Recovery:						
Fluorobenzene	86%			84%		

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GRO AK101

Date Extracted: 8-1-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**084AG115SB**			**084AG116SB**		
Lab ID:	07-225-15			07-225-16		
	Result	Flags	PQL	**Result**	Flags	PQL
Alaska GRO (C6 TO C10)	**ND**		2.4	**ND**		2.7
Surrogate Recovery:						
Fluorobenzene	85%			84%		

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GRO AK101

Date Extracted: 8-1-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**084AG117SB**			**084AG118SB**		
Lab ID:	07-225-17			07-225-18		
	Result	Flags	PQL	**Result**	Flags	PQL
Alaska GRO (C6 TO C10)	**3.5**	**Z**	2.4	**14**	**Z**	2.4
Surrogate Recovery:						
Fluorobenzene	83%			78%		

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GRO AK101

Date Extracted:	8-1-08
Date Analyzed:	8-1-08
Matrix: Soil	
Units: mg/kg (ppm)	
Client ID:	**084AG120TB**
Lab ID:	07-225-20

	Result	Flags	PQL
Alaska GRO (C6 TO C10)	**ND**		5.0
Surrogate Recovery:			
Fluorobenzene	90%		

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Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

GRO AK101
SCS QUALITY CONTROL

Date Extracted: 8-1-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: MB0801S1

	Result	Flags	PQL
Alaska GRO (C6 TO C10)	**ND**		5.0

Surrogate Recovery:
Fluorobenzene 93%

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

GRO AK101
SCS QUALITY CONTROL

Date Extracted: 8-1-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: MB0801S2

	Result	Flags	PQL
Alaska GRO (C6 TO C10)	**ND**		5.0

Surrogate Recovery:
Fluorobenzene 93%

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

GRO AK101
LCS/LCSD QUALITY CONTROL

Date Extracted: 8-1-08
Date Analyzed: 8-1-08

Matrix: Soil
Units: mg/kg (ppm)

Spike Level (ppm): 250

Lab ID:	SB0527S1 **SB**	Percent Recovery	SBD0527S1 **SBD**	Percent Recovery	**RPD**
Alaska GRO (C6 TO C10)	**220**	**88**	**218**	**87**	1
Surrogate Recovery:					
Fluorobenzene	86%		82%		

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and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

GRO AK101

Date Extracted: 7-29-08
Date Analyzed: 7-29-08

Matrix: Water
Units: ug/L (ppb)

Lab ID:	07-225-01			07-225-02		
Client ID:	**084AG101GW**			**084AG102GW**		
	Result	Flags	PQL	**Result**	Flags	PQL
Alaska GRO (C6-C10)	**490**	Z	100	**460**	Z	100
Surrogate Recovery:						
Fluorobenzene	98%			98%		

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
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Project: 14-139

GRO AK101

Date Extracted: 7-29-08
Date Analyzed: 7-29-08

Matrix: Water
Units: ug/L (ppb)

Lab ID:	07-225-04			07-225-13		
Client ID:	**084AG104GW**			**084AG113GW**		
	Result	Flags	PQL	**Result**	Flags	PQL
Alaska GRO (C6-C10)	**ND**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	96%			99%		

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Date of Report: August 11, 2008
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Project: 14-139

GRO AK101

Date Extracted: 7-29-08
Date Analyzed: 7-29-08

Matrix: Water
Units: ug/L (ppb)

Lab ID:	07-225-21			07-225-22		
Client ID:	**084AG121TB**			**084AG122GW**		
	Result	Flags	PQL	**Result**	Flags	PQL
Alaska GRO (C6-C10)	**ND**		100	**ND**		100
Surrogate Recovery:						
Fluorobenzene	97%			96%		

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Samples Submitted: July 28, 2008
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Project: 14-139

GRO AK101
SCS QUALITY CONTROL

Date Extracted: 7-29-08
Date Analyzed: 7-29-08

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0729W1

	Result	Flags	PQL
Alaska GRO (C6-C10)	**ND**		100

Surrogate Recovery:
Fluorobenzene 97%

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

GRO AK101
LCS/LCSD QUALITY CONTROL

Date Extracted: 7-29-08
Date Analyzed: 7-29-08

Matrix: Water
Units: ug/L (ppb)
Spike Level: 5000 ppb

Lab ID:	SB0729W1 **SB**	Percent Recovery	SBD0729W1 **SBD**	Percent Recovery	RPD
Alaska GRO (C6-C10)	**4990**	**100**	**4890**	**98**	2
Surrogate Recovery:					
Fluorobenzene	107%		115%		

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

DRO AK102

Date Extracted: 8-3-08
Date Analyzed: 8-3-08

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**084AG103SB**	**084AG105SB**	**084AG106SB**
Lab ID:	07-225-03	07-225-05	07-225-06
Diesel Range:	**ND**	**ND**	**ND**
PQL:	10	11	11
Identification:	---	---	---
Surrogate Recovery			
o-Terphenyl:	63%	67%	60%

Flags:

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and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

DRO AK102

Date Extracted: 8-3-08
Date Analyzed: 8-3-08

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**084AG107SB**	**084AG108SB**	**084AG109SB**
Lab ID:	07-225-07	07-225-08	07-225-09
Diesel Range:	**ND**	**ND**	**ND**
PQL:	11	11	10
Identification:	---	---	---
Surrogate Recovery			
o-Terphenyl:	68%	62%	58%

Flags:

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

DRO AK102

Date Extracted: 8-3-08
Date Analyzed: 8-3-08

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**084AG110SB**	**084AG111SB**	**084AG112SB**
Lab ID:	07-225-10	07-225-11	07-225-12
Diesel Range:	**ND**	**ND**	**ND**
PQL:	10	11	10
Identification:	---	---	---
Surrogate Recovery			
o-Terphenyl:	52%	58%	60%

Flags:

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

DRO AK102

Date Extracted: 8-3-08
Date Analyzed: 8-3-08

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**084AG114SB**	**084AG115SB**	**084AG116SB**
Lab ID:	07-225-14	07-225-15	07-225-16
Diesel Range:	**ND**	**ND**	**ND**
PQL:	10	10	10
Identification:	---	---	---
Surrogate Recovery			
o-Terphenyl:	59%	62%	59%

Flags:

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

DRO AK102

Date Extracted: 8-3&6-08
Date Analyzed: 8-3&6-08

Matrix: Soil
Units: mg/kg (ppm)

Client ID:	**084AG117SB**	**084AG118SB**
Lab ID:	07-225-17	07-225-18
Diesel Range:	**ND**	**ND**
PQL:	11	11
Identification:	---	---
Surrogate Recovery		
o-Terphenyl:	70%	63%

Flags:

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

DRO AK102
METHOD BLANK QUALITY CONTROL

Date Extracted:	8-3-08
Date Analyzed:	8-3-08
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	MB0803S1
Diesel Range:	**ND**
PQL:	10
Identification:	---

Surrogate Recovery

o-Terphenyl:	60%

Flags:

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and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

DRO AK102
METHOD BLANK QUALITY CONTROL

Date Extracted:	8-6-08
Date Analyzed:	8-6-08
Matrix:	Soil
Units:	mg/kg (ppm)
Lab ID:	MB0806S1
Diesel Range:	**ND**
PQL:	10
Identification:	---

Surrogate Recovery

o-Terphenyl:	79%

Flags:

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

DRO AK102
DUPLICATE QUALITY CONTROL

Date Extracted:	8-3-08
Date Analyzed:	8-3-08
Matrix:	Soil
Units:	mg/kg (ppm)

Lab ID:	07-225-03	07-225-03 DUP
Diesel Range:	**ND**	**ND**
PQL:	10	10
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	63%	67%

Flags:

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

DRO AK102
DUPLICATE QUALITY CONTROL

Date Extracted:	8-3-08
Date Analyzed:	8-3-08
Matrix:	Soil
Units:	mg/kg (ppm)

Lab ID:	07-225-06	07-225-06 DUP
Diesel Range:	**ND**	**ND**
PQL:	10	10
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	60%	59%

Flags:

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

DRO AK102
DUPLICATE QUALITY CONTROL

Date Extracted:	8-6-08
Date Analyzed:	8-6-08
Matrix:	Soil
Units:	mg/kg (ppm)

Lab ID:	07-225-17	07-225-17 DUP
Diesel Range:	**ND**	**ND**
PQL:	10	10
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	70%	79%

Flags:

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

DRO AK102
SB/SBD QUALITY CONTROL

Date Extracted: 8-3-08
Date Analyzed: 8-3-08

Matrix: Soil
Units: mg/kg (ppm)

Spike Level: 100 ppm

Lab ID:	SB0803S1	SB0803S1 DUP
Diesel Range:	**83.4**	**96.7**
PQL:	10	10
Percent Recovery:	83	96
RPD:	12	
Surrogate Recovery		
o-Terphenyl:	68%	80%

Flags:

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

DRO AK102
SB/SBD QUALITY CONTROL

Date Extracted: 8-6-08
Date Analyzed: 8-6-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID:	SB0806S1	SB0806S1 DUP
Diesel Range:	**97.8**	**98.0**
PQL:	10	10
Percent Recovery:	98	98
RPD:	0	
Surrogate Recovery		
o-Terphenyl:	84%	88%

Flags:

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

DRO AK102

Date Extracted: 8-4-08
Date Analyzed: 8-4-08

Matrix: Water
Units: mg/L (ppm)

Client ID:	**084AG101GW**	**084AG102GW**	**084AG104GW**
Lab ID:	07-225-01	07-225-02	07-225-04
Diesel Range:	**ND**	**ND**	**ND**
PQL:	0.24	0.26	0.25
Identification:	---	---	---
Surrogate Recovery			
o-Terphenyl:	74%	74%	76%
Flags:	Y	Y	Y

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

DRO AK102

Date Extracted: 8-4-08
Date Analyzed: 8-4-08

Matrix: Water
Units: mg/L (ppm)

Client ID:	**084AG113GW**	**084AG122GW**
Lab ID:	07-225-13	07-225-22
Diesel Range:	**ND**	**ND**
PQL:	0.25	0.24
Identification:	---	---
Surrogate Recovery		
o-Terphenyl:	73%	74%
Flags:	Y	Y

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

DRO AK102
METHOD BLANK QUALITY CONTROL

Date Extracted:	8-4-08
Date Analyzed:	8-4-08
Matrix:	Water
Units:	mg/L (ppm)
Lab ID:	MB0804W1
Diesel Range:	**ND**
PQL:	0.25
Identification:	---
Surrogate Recovery	
o-Terphenyl:	76%
Flags:	Y

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

DRO AK102
DUPLICATE QUALITY CONTROL

Date Extracted:	8-4-08
Date Analyzed:	8-4-08
Matrix:	Water
Units:	mg/L (ppm)

Lab ID:	07-225-13	07-225-13 DUP
Diesel Range:	**ND**	**ND**
PQL:	0.25	0.25
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	73%	76%
Flags:	Y	Y

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

DRO AK102
SB/SBD QUALITY CONTROL

Date Extracted:	8-4-08
Date Analyzed:	8-4-08
Matrix:	Water
Units:	mg/L (ppm)
Spike Level:	2.50 ppm

Lab ID:	SB0804W1	SB0804W1 DUP
Diesel Range:	**2.09**	**2.08**
PQL:	0.25	0.25
Percent Recovery:	84	83
RPD:	1	
Surrogate Recovery		
o-Terphenyl:	81%	79%
Flags:	Y	Y

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

TOTAL METALS
EPA 6010B/7471A

Date Extracted: 7-28&29-08
Date Analyzed: 7-29-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-09
Client ID: 084AG109SB

Analyte	Method	Result	PQL
Arsenic	6010B	**ND**	10
Barium	6010B	**19**	2.6
Cadmium	6010B	**ND**	0.52
Chromium	6010B	**18**	0.52
Lead	6010B	**ND**	5.2
Mercury	7471A	**ND**	0.26
Selenium	6010B	**ND**	10
Silver	6010B	**ND**	0.52

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

TOTAL METALS
EPA 6010B/7471A

Date Extracted: 7-28&29-08
Date Analyzed: 7-29-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-10
Client ID: 084AG110SB

Analyte	Method	Result	PQL
Arsenic	6010B	**ND**	10
Barium	6010B	**35**	2.6
Cadmium	6010B	**ND**	0.52
Chromium	6010B	**24**	0.52
Lead	6010B	**ND**	5.2
Mercury	7471A	**ND**	0.26
Selenium	6010B	**ND**	10
Silver	6010B	**ND**	0.52

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

TOTAL METALS
EPA 6010B/7471A
METHOD BLANK QUALITY CONTROL

Date Extracted: 7-28&29-08
Date Analyzed: 7-29-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: MB0728S3&MB0729S3

Analyte	Method	Result	PQL
Arsenic	6010B	**ND**	10
Barium	6010B	**ND**	2.5
Cadmium	6010B	**ND**	0.50
Chromium	6010B	**ND**	0.50
Lead	6010B	**ND**	5.0
Mercury	7471A	**ND**	0.25
Selenium	6010B	**ND**	10
Silver	6010B	**ND**	0.50

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

TOTAL METALS
EPA 6010B/7471A
DUPLICATE QUALITY CONTROL

Date Extracted: 7-28&29-08
Date Analyzed: 7-29-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-10

Analyte	Sample Result	Duplicate Result	RPD	PQL	Flags
Arsenic	**ND**	**ND**	NA	10	
Barium	**33.2**	**34.5**	4	2.5	
Cadmium	**ND**	**ND**	NA	0.50	
Chromium	**22.8**	**25.6**	12	0.50	
Lead	**ND**	**ND**	NA	5.0	
Mercury	**ND**	**ND**	NA	0.25	
Selenium	**ND**	**ND**	NA	10	
Silver	**ND**	**ND**	NA	0.50	

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

TOTAL METALS
EPA 6010B/7471A
MS/MSD QUALITY CONTROL

Date Extracted: 7-28&29-08
Date Analyzed: 7-29-08

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 07-225-10

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Arsenic	100	**95.5**	95	**99.3**	99	4	
Barium	100	**129**	95	**131**	98	2	
Cadmium	50	**48.3**	97	**49.3**	99	2	
Chromium	100	**119**	96	**121**	98	2	
Lead	250	**238**	95	**246**	98	4	
Mercury	0.50	**0.483**	97	**0.488**	98	1	
Selenium	100	**91.6**	92	**98.2**	98	7	
Silver	25	**21.4**	85	**21.7**	87	2	

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Date of Report: August 11, 2008
Samples Submitted: July 28, 2008
Laboratory Reference: 0807-225
Project: 14-139

% MOISTURE

Date Analyzed: 7-28-08

Client ID	Lab ID	% Moisture
084AG103SB	07-225-03	3
084AG105SB	07-225-05	6
084AG106SB	07-225-06	5
084AG107SB	07-225-07	5
084AG108SB	07-225-08	8
084AG109SB	07-225-09	4
084AG110SB	07-225-10	4
084AG111SB	07-225-11	5
084AG112SB	07-225-12	2
084AG114SB	07-225-14	3
084AG115SB	07-225-15	3
084AG116SB	07-225-16	4
084AG117SB	07-225-17	5
084AG118SB	07-225-18	6

This report pertains to the samples analyzed in accordance with the chain of custody,
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OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z - Alaska GRO result is attributed to a single peak.

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Chain of Custody

OnSite Environmental Inc.
Phone: (425) 883-3881 • Fax: (425) 885-4603

Company: OASIS
Project Number: 14-139
Project Name: 4th + Gambell
Project Manager: Ben Mortich
Sampled by: Craig Scala / Ben Mortich

Turnaround Request (in working days)

(Check One)

- ☐ Same Day ☐ 1 Day
- ☐ 2 Day ☐ 3 Day
- ☒ Standard (7 working days) (TPH analysis 5 working days)
- ☐ _____ (other)

Laboratory Number: 07·225

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270D	PAHs by 8270D / SIM	PCBs by 8082	Pesticides by 8081A	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	GRO AK101	DRO AK102	RCRA Metals				% Moisture
1	084AG101GW	7/24/08	1515	W	7				3										2	2					
2	084AG102GW	7/24/08	1545	W	7				3										2	2					
3	084AG103SB	7/24/08	1615	S	3				1										1	1					/
4	084AG104GW	7/24/08	1635	W	7				3										2	2					
5	084AG105SB	7/24/08	1925	S	3				1										1	1					/
6	084AG106SB	7/24/08	1930	S	3				1										1	1					
7	084AG107SB	7/24/08	1435	S	3				1										1	1					
8	084AG108SB	7/24/08	1940	S	3				1										1	1					
9	084AG109SB	7/25/08	1055	S	~~3~~ 4 AB				1										1	1	1				
10	084AG110SB	7/25/08	1105	S	~~4~~ 3				1										1	1	1				↓

	Signature	Company	Date	Time
Relinquished by	[signature]	OASIS	7/27/08	2130
Received by	M. Van	OSE	7/28/08	945
Relinquished by				
Received by				
Relinquished by				
Received by				

Comments/Special Instructions: Elevated PCE concentrations in 101GW, 102GW, 104GW, 105-108SB, 109SB, 110SB

Reviewed by/Date

Reviewed by/Date

Chromatograms with final report ☐

DISTRIBUTION LEGEND: White - OnSite Copy Yellow - Report Copy Pink - Client Copy

Chain of Custody

Page 2 of 3

OnSite Environmental Inc.

Phone: (425) 883-3881 • Fax: (425) 885-4603

Company: OASIS

Project Number: 14-139

Project Name: 4th & Gambell

Project Manager: Ben Mortich

Sampled by: Craig Scola / Ben Mortich

Turnaround Request (in working days)

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Day
- ☐ 3 Day
- ☒ Standard (7 working days)
  (TPH analysis 5 working days)
- ☐ _____ (other)

Laboratory Number: 07·225

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270D	PAHs by 8270D / SIM	PCBs by 8082	Pesticides by 8081A	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	GRO AK101	DRO AK102	% Moisture
11	084AG111SB	7/25/08	1435	S	3				1	1									1	1	
12	084AG112SB	7/25/08	1440	S	3				1	1									1	1	
13	~~084AG113SB~~ 084AG113GW	7/25/08	1630	W	10				5										3	4	
14	084AG114SB	7/25/08	1740	S	3				1										1	1	
15	084AG115SB	7/25/08	1800	S	3				1										1	1	
16	084AG116SB	7/25/08	1830	S	3				1										1	1	
17	084AG117SB	7/25/08	1950	S	3				1										1	1	
18	084AG118SB	7/25/08	1955	S	3				1										1	1	
19	084AG119TB			↓	1				1												
20	084AG120TB			↓	1														1		

	Signature	Company	Date	Time
Relinquished by		OASIS	7/25/08	2130
Received by		OSE	7/28/08	945
Relinquished by				
Received by				
Relinquished by				
Received by				

Comments/Special Instructions:

Elevated PCE concentrations in 114SB, 117SB, 118SB

Sample 084AG113GW is MS/MSD

Reviewed by/Date

Reviewed by/Date

Chromatograms with final report ☐

DISTRIBUTION LEGEND: White - OnSite Copy Yellow - Report Copy Pink - Client Copy

Chain of Custody

OnSite Environmental Inc.
Phone: (425) 883-3881 • Fax: (425) 885-4603

Company: OASIS
Project Number: 14-139
Project Name: 4th + Gambell
Project Manager: Ben Mutich
Sampled by: Craig Sale / Ben Mutich

Turnaround Request (in working days)

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Day
- ☐ 3 Day
- ☒ Standard (7 working days)
  (TPH analysis 5 working days)
- ☐ _____ (other)

Laboratory Number: 07-225

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270D	PAHs by 8270D / SIM	PCBs by 8082	Pesticides by 8081A	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	AK101 GRO	AK102 DRO	% Moisture
21	084AG121TB			W	3				2										1		
22	084AG122GW	7/25/08	2140	W	7				3										2	2	
23	084AG123WA	7/25/08	2155	W	3				3												

Relinquished by: [signature] — 7/26/08

	Signature	Company	Date	Time
Relinquished by	[signature]	OASIS	7/27/08	2130
Received by	[signature]	OSE	7/28/08	945
Relinquished by				
Received by				
Relinquished by				
Received by				

Comments/Special Instructions: Elevated PCE concentration in 122GW, possibly in 123WA

Reviewed by/Date

Reviewed by/Date

☐ Chromatograms with final report

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APPENDIX E

Laboratory Data Review Checklists

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Laboratory Data Review Checklist

Completed by:	Marty Hannah
Title:	Environmental Scientist
Date:	August 14, 2008
CS Report Name:	SITE CHARACTERIZATION 4TH AND GAMBELL SITE, ALASKA REAL ESTATE PARKING LOT
Report Date:	September 15, 2008
Consultant Firm:	OASIS Environmental, Inc.
Laboratory Name:	ON-SITE LABORATORIES-Redmond, WA
Laboratory Report Number:	0807-225
ADEC File Number:	
ADEC RecKey Number:	

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   ☑ Yes ☐ No Comments:

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   ☐ Yes ☐ No Comments:

   Not Applicable

2. Chain of Custody (COC)

   a. COC information completed, signed, and dated (including released/received by)?

   ☑ Yes ☐ No Comments:

b. Correct analyses requested?

☒ Yes ☐ No Comments:

All DRO water sample extracts received a silica gel clean up even though it was not indicated on the CoC.

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

☒ Yes ☐ No Comments:

No temperature upon receipt was indicated on the CoC nor case narrative. The case narrative states the samples were maintained between 2 and 6 ºC at the laboratory.

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

☒ Yes ☐ No Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

☒ Yes ☐ No Comments:

There was no sample receipt form included with the data packet. The case narrative did not indicate any issues with sample condition.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

☐ Yes ☐ No Comments:

No discrepanicies were noted.

e. Data quality or usability affected? Explain.

Comments:

All sample results were usable for project purposes.

4. Case Narrative

a. Present and understandable?

☒ Yes ☐ No Comments:

b. Discrepancies, errors or QC failures identified by the lab?

☐ Yes ☐ No Comments:

No discrepancies or errors were noted by the laboratory.

c. Were all corrective actions documented?

☐ Yes ☐ No Comments:

No corrective actions were required.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Sample results are usable for project purposes.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

☑ Yes ☐ No Comments:

All DRO water sample extracts received a silica gel clean up even though it was not indicated on the CoC.

b. All applicable holding times met?

☑ Yes ☐ No Comments:

c. All soils reported on a dry weight basis?

☑ Yes ☐ No Comments:

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

☑ Yes ☐ No Comments:

e. Data quality or usability affected? Explain.

Comments:

All sample results are usable for project purposes.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

☑ Yes ☐ No Comments:

ii. All method blank results less than PQL?

☑ Yes ☐ No Comments:

iii. If above PQL, what samples are affected?

Comments:

Not applicable

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No Comments:

Not applicable

v. Data quality or usability affected? Explain.

Comments:

Not applicable

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☑ Yes ☐ No Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

☑ Yes ☐ No Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

☑ Yes ☐ No Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

☑ Yes ☐ No Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

Not applicable

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No Comments:

Not applicable

vii. Data quality or usability affected? Explain.

Comments:

All sample results are usable for project purposes without qualification with regards to QC samples.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

☑ Yes ☐ No Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

☑ Yes ☐ No Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No Comments:

Not applicable

iv. Data quality or usability affected? Explain.

Comments:

Not applicable

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and cooler?

☑ Yes ☐ No Comments:

ii. All results less than PQL?

☑ Yes ☐ No Comments:

iii. If above PQL, what samples are affected?

Comments:

Not applicable

iv. Data quality or usability affected? Explain.

Comments:

Not applicable

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☑ Yes ☐ No Comments:

ii. Submitted blind to lab?

☑ Yes ☐ No Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☐ Yes ☒ No Comments:

iv. Data quality or usability affected? Explain.

Comments:

PCE sample results for sample 084AG105SB and its duplicate failed to meet RPD limits (110%). Sample results were flagged JF and are considered estimates. All other results for this sample and its duplicate were non-detect and were not flagged. A second soil sample duplicate along with the water duplicate met RPD limits.

f. Decontamination or Equipment Blank (if applicable)

☐ Yes ☐ No ☒ Not Applicable

i. All results less than PQL?

☐ Yes ☐ No Comments:

Not applicable

ii. If above PQL, what samples are affected?

Comments:

Not applicable

iii. Data quality or usability affected? Explain.

Comments:

Not applicable

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Not applicable

☐ Yes ☐ No Comments:

APPENDIX F

Conceptual Site Model Forms

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Human Health Conceptual Site Model
Scoping Form

Site Name: 4th and Gambell

File Number:

Completed by: B Martich

Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, a CSM graphic and text must be submitted with the site characterization work plan.

General Instructions: Follow the italicized instructions in each section below.

1. *General Information:*

Sources *(check potential sources at the site)*

- [x] USTs
- [x] ASTs
- [ ] Dispensers/fuel loading racks
- [x] Drums
- [ ] Vehicles
- [ ] Landfills
- [ ] Transformers
- [ ] Other: _____

Release Mechanisms *(check potential release mechanisms at the site)*

- [x] Spills
- [x] Leaks
- [x] Direct discharge
- [ ] Burning
- [ ] Other: _____

Impacted Media *(check potentially-impacted media at the site)*

- [x] Surface soil (0-2 feet bgs*)
- [x] Subsurface Soil (>2 feet bgs)
- [x] Air
- [x] Groundwater
- [x] Surface water
- [ ] Other: _____

Receptors (*check receptors that could be affected by contamination at the site)*

- [x] Residents (adult or child)
- [x] Commercial or industrial worker
- [x] Construction worker
- [ ] Subsistence harvester (i.e., gathers wild foods)
- [ ] Subsistence consumer (i.e., eats wild foods)
- [x] Site visitor
- [x] Trespasser
- [ ] Recreational user
- [ ] Farmer
- [ ] Other: _____

* bgs – below ground surface

2. *Exposure Pathways:* *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact –

1 Incidental Soil Ingestion

Is soil contaminated anywhere between 0 and 15 feet bgs? ☑

Do people use the site or is there a chance they will use the site in the future? ☑

If both boxes are checked, label this pathway complete: Complete

2 Dermal Absorption of Contaminants from Soil

Is soil contaminated anywhere between 0 and 15 feet bgs? ☑

Do people use the site or is there a chance they will use the site in the future? ☑

Can the soil contaminants permeate the skin? (Contaminants listed below, or within the groups listed below, should be evaluated for dermal absorption). ☐

Arsenic	Lindane
Cadmium	PAHs
Chlordane	Pentachlorophenol
2,4-dichlorophenoxyacetic acid	PCBs
Dioxins	SVOCs
DDT	

If all of the boxes are checked, label this pathway complete: _____

b) Ingestion –

1 Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, OR are contaminants expected to migrate to groundwater in the future? ☑

Could the potentially affected groundwater be used as a current or future drinking water source? *Please note, only leave the box unchecked if ADEC has determined the groundwater is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350.* ☑

If both the boxes are checked, label this pathway complete: Complete

2 Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water OR are contaminants expected to migrate to surface water in the future? ☑

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? *Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities).* ☐

If both boxes are checked, label this pathway complete: _____

3 Ingestion of Wild Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild food? ☐

Do the site contaminants have the potential to bioaccumulate (*see* Appendix A)? ☐

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. the top 6 feet of soil, in groundwater that **could be** connected to surface water, etc.) ☐

If all of the boxes are checked, label this pathway complete: _____

c) Inhalation

1 Inhalation of Outdoor Air

Is soil contaminated anywhere between 0 and 15 feet bgs? ☑

Do people use the site or is there a chance they will use the site in the future? ☑

Are the contaminants in soil volatile (*See Appendix B*)? ☑

If all of the boxes are checked, label this pathway complete: Complete

2 Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be placed on the site in an area that could be affected by contaminant vapors? (i.e., within 100 feet, horizontally or vertically, of the contaminated soil or groundwater, <u>or</u> subject to "preferential pathways" that promote easy airflow, like utility conduits or rock fractures) ☑

Are volatile compounds present in soil or groundwater (*See Appendix C*)? ☑

If both boxes are checked, label this pathway complete: Complete

3. Additional Exposure Pathways: *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

Dermal Exposure to Contaminants in Groundwater and Surface Water

Exposure from this pathway may need to be assessed only in cases where DEC water-quality or drinking-water standards are not being applied as cleanup levels. Examples of conditions that may warrant further investigation include:

- Climate permits recreational use of waters for swimming,
- Climate permits exposure to groundwater during activities, such as construction, without protective clothing, or
- Groundwater or surface water is used for household purposes.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

Inhalation of Volatile Compounds in Household Water

Exposure from this pathway may need to be assessed only in cases where DEC water-quality or drinking-water standards are not being applied as cleanup levels. Examples of conditions that may warrant further investigation include:

- The contaminated water is used for household purposes such as showering, laundering, and dish washing, and
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix B)

Check the box if further evaluation of this pathway is needed: ☐

Comments:

Inhalation of Fugitive Dust

Generally DEC soil ingestion cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway, although this is not true in the case of chromium. Examples of conditions that may warrant further investigation include:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers. This size can be inhaled and would be of concern for determining if this pathway is complete.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during recreational or some types of subsistence activities. People then incidentally **ingest** sediment from normal hand-to-mouth activities. In addition, **dermal absorption of contaminants** may be of concern if people come in contact with sediment and the contaminants are able to permeate the skin (see dermal exposure to soil section). This type of exposure is rare but it should be investigated if:

- Climate permits recreational activities around sediment, and/or
- Community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

ADEC soil ingestion cleanup levels are protective of direct contact with sediment. If they are determined to be over-protective for sediment exposure at a particular site, other screening levels could be adopted or developed.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

4. Other Comments (*Provide other comments as necessary to support the information provided in this form.)*

APPENDIX A

BIOACCUMULATIVE COMPOUNDS

Table A-1: List of Compounds of Potential Concern for Bioaccumulation

Organic compounds are identified as bioaccumulative if they have a BCF equal to or greater than 1,000 or a log K_{ow} greater than 3.5. Inorganic compounds are identified as bioaccumulative if they are listed as such by EPA (2000). Those compounds in Table X of 18 AAC 75.345 that are bioaccumulative, based on the definition above, are listed below.

Aldrin	DDT	Lead
Arsenic	Dibenzo(a,h)anthracene	Mercury
Benzo(a)anthracene	Dieldrin	Methoxychlor
Benzo(a)pyrene	Dioxin	Nickel
Benzo(b)fluoranthene	Endrin	PCBs
Benzo(k)fluoranthene	Fluoranthene	
Cadmium	Heptachlor	Pyrene
Chlordane	Heptachlor epoxide	Selenium
Chrysene	Hexachlorobenzene	Silver
Copper	Hexachlorocyclopentadiene	Toxaphene
DDD	Indeno(1,2,3-c,d)pyrene	Zinc
DDE		

Because BCF values can relatively easily be measured or estimated, the BCF is frequently used to determine the potential for a chemical to bioaccumulate. A compound with a BCF greater than 1,000 is considered to bioaccumulate in tissue (EPA 2004b).

For inorganic compounds, the BCF approach has not been shown to be effective in estimating the compound's ability to bioaccumulate. Information available, either through scientific literature or site-specific data, regarding the bioaccumulative potential of an inorganic site contaminant should be used to determine if the pathway is complete.

The list was developed by including organic compounds that either have a BCF equal to or greater than 1,000 or a log K_{ow} greater than 3.5 and inorganic compounds that are listed by the United States Environmental Protection Agency (EPA) as being bioaccumulative (EPA 2000). The BCF can also be estimated from a chemical's physical and chemical properties. A chemical's octanol-water partitioning coefficient (K_{ow}) along with defined regression equations can be used to estimate the BCF. EPA's Persistent, Bioaccumulative, and Toxic (PBT) Profiler (EPA 2004) can be used to estimate the BCF using the K_{ow} and linear regressions presented by Meylan et al. (1996). The PBT Profiler is located at http://www.pbtprofiler.net/. For compounds not found in the PBT Profiler, DEC recommends using a log K_{ow} greater than 3.5 to determine if a compound is bioaccumulative.

APPENDIX B

VOLATILE COMPOUNDS

Table B-1: List of Volatile Compounds of Potential Concern
Common volatile contaminants of concern at contaminated sites. A chemical is defined as volatile if the Henry's Law constant is 1 x 10^{-5} atm-m^3/mol or greater and the molecular weight less than 200 g/mole (g/mole; EPA 2004a). Those compounds in Table X of 18 AAC 75.345 that are volatile, based on the definition above, are listed below.

Acenaphthene	1,4-dichlorobenzene	Pyrene
Acetone	1,1-dichloroethane	Styrene
Anthracene	1,2-dichloroethane	1,1,2,2-tetrachloroethane
Benzene	1,1-dichloroethylene	Tetrachloroethylene
Bis(2-chlorethyl)ether	Cis-1,2-dichloroethylene	Toluene
Bromodichloromethane	Trans-1,2-dichloroethylene	1,2,4-trichlorobenzene
Carbon disulfide	1,2-dichloropropane	1,1,1-trichloroethane
Carbon tetrachloride	1,3-dichloropropane	1,1,2-trichloroethane
Chlorobenzene	Ethylbenzene	Trichloroethylene
Chlorodibromomethane	Fluorene	Vinyl acetate
Chloroform	Methyl bromide	Vinyl chloride
2-chlorophenol	Methylene chloride	Xylenes
Cyanide	Naphthalene	GRO
1,2-dichlorobenzene	Nitrobenzene	DRO

APPENDIX C

COMPOUNDS OF CONCERN FOR VAPOR MIGRATION

Table C-1: List of Compounds of Potential Concern for the Vapor Migration

A chemical is considered sufficiently toxic if the vapor concentration of the pure component poses an incremental lifetime cancer risk greater than 10-6 or a non-cancer hazard index greater than 1. A chemical is considered sufficiently volatile if it's Henry's Law constant is 1 x 10^{-5} atm-m^3/mol or greater.

Acenaphthene	Dibenzofuran	Hexachlorobenzene
Acetaldehyde	1,2-Dibromo-3-chloropropane	Hexachlorocyclopentadiene
Acetone	1,2-Dibromoethane (EDB)	Hexachloroethane
Acetonitrile	1,3-Dichlorobenzene	Hexane
Acetophenone	1,2-Dichlorobenzene	Hydrogen cyanide
Acrolein	1,4-Dichlorobenzene	Isobutanol
Acrylonitrile	2-Nitropropane	Mercury (elemental)
Aldrin	N-Nitroso-di-n-butylamine	Methacrylonitrile
alpha-HCH (alpha-BHC)	n-Propylbenzene	Methoxychlor
Benzaldehyde	o-Nitrotoluene	Methyl acetate
Benzene	o-Xylene	Methyl acrylate
Benzo(b)fluoranthene	p-Xylene	Methyl bromide
Benzylchloride	Pyrene	Methyl chloride chloromethane)
beta-Chloronaphthalene	sec-Butylbenzene	Methylcyclohexane
Biphenyl	Styrene	Methylene bromide
Bis(2-chloroethyl)ether	tert-Butylbenzene	Methylene chloride
Bis(2-chloroisopropyl)ether	1,1,1,2-Tetrachloroethane	Methylethylketone (2-butanone)
Bis(chloromethyl)ether	1,1,2,2-Tetrachloroethane	Methylisobutylketone
Bromodichloromethane	Tetrachloroethylene	Methylmethacrylate
Bromoform	Dichlorodifluoromethane	2-Methylnaphthalene
1,3-Butadiene	1,1-Dichloroethane	MTBE
Carbon disulfide	1,2-Dichloroethane	m-Xylene
Carbon tetrachloride	1,1-Dichloroethylene	Naphthalene
Chlordane	1,2-Dichloropropane	n-Butylbenzene
2-Chloro-1,3-butadiene (chloroprene)	1,3-Dichloropropene	Nitrobenzene
Chlorobenzene	Dieldrin	Toluene
1-Chlorobutane	Endosulfan	trans-1,2-Dichloroethylene
Chlorodibromomethane	Epichlorohydrin	1,1,2-Trichloro-1,2,2-trifluoroethane
Chlorodifluoromethane	Ethyl ether	1,2,4-Trichlorobenzene
Chloroethane (ethyl chloride)	Ethylacetate	1,1,2-Trichloroethane
Chloroform	Ethylbenzene	1,1,1-Trichloroethane
2-Chlorophenol	Ethylene oxide	Trichloroethylene
2-Chloropropane	Ethylmethacrylate	Trichlorofluoromethane
Chrysene	Fluorene	1,2,3-Trichloropropane
cis-1,2-Dichloroethylene	Furan	1,2,4-Trimethylbenzene
Crotonaldehyde (2-butenal)	Gamma-HCH (Lindane)	1,3,5-Trimethylbenzene
Cumene	Heptachlor	Vinyl acetate
DDE	Hexachloro-1,3-butadiene	Vinyl chloride (chloroethene)

Source: EPA 2002.

HUMAN HEALTH CONCEPTUAL SITE MODEL

Site: 4th and Gambell

Completed By: B Martich

Date Completed: 8/14/2008

Follow the directions below. Do not consider engineering or land use controls when describing pathways.

(1)

Check the media that could be directly affected by the release.

(2)

For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Briefly list other mechanisms or reference the report for details.

(3)

Check exposure media identified in (2).

(4)

Check exposure pathways that are complete or need further evaluation. The pathways identified must agree with Sections 2 and 3 of the CSM Scoping Form.

(5)

Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, or "C/F" for both current and future receptors.

Media	Transport Mechanisms	Exposure Media	Exposure Pathways	Current & Future Receptors: Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☑ Surface Soil (0-2 ft bgs)	☑ Direct release to surface soil — *check soil*	☑ soil	☑ Incidental Soil Ingestion	C	F	C	F			
	☑ Migration or leaching to subsurface — *check soil*		☐ Dermal Absorption of Contaminants from Soil							
	☑ Migration or leaching to groundwater — *check groundwater*									
	☑ Volatilization — *check air*									
	☐ Runoff or erosion — *check surface water*									
	☐ Uptake by plants or animals — *check biota*									
	☐ Other (*list*): 4th and Gambell									
☑ Subsurface Soil (2-15 ft bgs)	☑ Direct release to subsurface soil — *check soil*	☑ groundwater	☑ Ingestion of Groundwater	C	F	C	F			
	☑ *Migration to groundwater* — *check groundwater*		☐ Dermal Absorption of Contaminants in Groundwater							
	☑ *Volatilization* — *check air*		☑ Inhalation of Volatile Compounds in Tap Water							
	☐ *Other (list):*									
☐ Ground-water	☐ Direct release to groundwater — *check groundwater*	☑ air	☑ Inhalation of Outdoor Air	C	F	C	F			
	☐ *Volatilization* — *check air*		☑ Inhalation of Indoor Air	C	F	C	F			
	☐ *Flow to surface water body* — *check surface water*		☐ Inhalation of Fugitive Dust							
	☐ *Flow to sediment* — *check sediment*									
	☑ *Uptake by plants or animals* — *check biota*									
	☑ *Other (list):* B Martich									
☑ Surface Water	☑ Direct release to surface water — *check surface water*	☑ surface water	☑ Ingestion of Surface Water							
	☐ *Volatilization* — *check air*		☐ Dermal Absorption of Contaminants in Surface Water							
	☑ *Sedimentation* — *check sediment*		☑ Inhalation of Volatile Compounds in Tap Water							
	☑ *Uptake by plants or animals* — *check biota*									
	☐ *Other (list):*									
☑ Sediment	☑ Direct release to sediment — *check sediment*	☐ sediment	☑ Direct Contact with Sediment							
	☑ *Resuspension, runoff, or erosion* — *check surface water*									
	☑ *Uptake by plants or animals* — *check biota*	☑ biota	☐ Ingestion of Wild Foods							
	☐ *Other (list):*									

Revised 3/21/06